FAYETTE.

Population: 8,605.—White, 5,742; colored, 2,863.
Area: 220 square miles.—Woodland, all; metamorphic, all.
Tilled lands: 59,278 acres.—Area planted in cotton, 21,787 acres; in corn, 14,195 acres; in wheat, 4,259 acres; in oats, 3,477 acres; in rye, 16 acres.
Cotton production: 7,131 bales; average cotton product per acre, 0.33 bale, 465 pounds seed-cotton, or 155 pounds cotton lint.

A prominent feature of Fayette county is the prevalence of gray granitic soils over the entire county, with here and there a spot of red land, from associated hornblendic rocks. The county lies in the fork of Flint river and Line creek, while Whitewater creek flows south through the middle portion. The granite outcrops are not as prominent as in counties north, and seem to have been disintegrated more fully.

The surface of the country is slightly hilly and undulating, but all of it is probably tillable. Two narrow belts of red lands occur at 2½ and 5 miles, respectively, south from Fayetteville, each with a width of from one-half to three-fourths of a mile. One-half of the county is said to have been cleared of its timber growth, which comprised oak, hickory, and pine; but near Brook's station long-leaf pine forms a prominent feature.

The tilled lands embrace 42.1 per cent. of the county area. Cotton is the chief crop, and has an average of 99 acres per square mile, or 36.8 per cent. of the lands under cultivation. The average product per acre is low, although fertilizers are used more or less in cotton culture.

ABSTRACT FROM THE REPORT OF ISAAC G. WOOLSEY, M. D., OF FAYETTEVILLE.

The lands of this county consist of creek and branch bottoms, and uplands, or a mixture of gray, red, or mulatto soils, with clay subsoils.

The *uplands* are devoted chiefly to cotton culture, the gray sandy lands being better than the red.

The *gray lands* cover 75 per cent. of the area of the county, and have a growth of oaks of several varieties, pine, chestnut, and hickory. The soil is from 3 to 6 inches deep, and has a clay subsoil. It is rather late, cold, and ill drained, is easy to cultivate, and is best adapted to cotton. The crops of the county are cotton, corn, wheat, oats, potatoes, etc. Cotton comprises 60 per cent. of these, grows to a height of from 2 to 4 feet, and yields 800 pounds of seed-cotton per acre when fresh. By a cultivation of six years the yield is reduced some 300 or 500 pounds, and the fiber becomes shorter; 1,545 pounds make 475 pounds of lint. Very little of the land lies out, and when it is again taken in it yields almost as much as when fresh. It is very much injured by washing, but this is readily prevented by hillside ditching and rock dams. The valleys are usually improved by the washings of the uplands. Crab-grass is the chief enemy to cotton crops. But little cotton is planted on the creek bottoms, as it is liable to rust.

Cotton is shipped by railroad either to Atlanta or to Savannah.

SPALDING.

Population: 12,585.—White, 5,439; colored, 7,146.
Area: 220 square miles.—Woodland, all; metamorphic, all.
Tilled lands: 53,335 acres.—Area planted in cotton, 22,935 acres; in corn, 15,560 acres; in wheat, 4,084 acres; in oats, 3,132 acres; in rye, 18 acres.
Cotton production: 7,418 bales; average cotton product per acre, 0.32 bale, 462 pounds seed-cotton, or 154 pounds cotton lint.

The surface of Spalding county is rolling and broken, well timbered, and is about equally divided between the gray granitic lands on the north and the red and gray sandy lands on the south. The Central railroad, in its southerly course through the county, has its road-bed along the top of the Atlantic and Gulf water-divide, a low ridge with gradual descents eastward, and to the Flint river on the west. Griffin, which is situated on this ridge, has an altitude of 975 feet above the sea. The granitic lands, with their gray sandy and gravelly soils, cover all the northern part of the county to within 3 miles north of Griffin, the region also extending southward through the county on the west. Black mica enters largely into the composition of the rock, producing in some localities a red soil.

A narrow belt of red land is found 3 miles north of Griffin, crossing the Newnan railroad 4 miles west of the town and covering a large area in the southern part of the county. On the southeast both gray and red lands are found intermixed, but the gray predominates. Three per cent. of the county area is said to be too swampy and 2½ per cent. too broken for cultivation. Lands under cultivation comprise 37.1 per cent. of the county area, and are chiefly planted in cotton, corn, and small grain. Cotton has the greatest acreage, and averages 104.3 acres per square mile, or 43 per cent. of tilled lands.

ABSTRACTS FROM THE REPORTS OF J. M. KELB, S. F. GRAY, AND H. T. PATTERSON, OF SUNNY SIDE.

The chief cotton lands are the uplands, with their variety of red, gray, and mulatto soils. The lowlands have but a small area devoted to cotton on account of early fall frosts, which cut off the crop.

The *gray lands*, with their sandy soils, from 3 to 12 inches deep, comprise 60 per cent. of the area of the county. The subsoil is a red and yellow clay, gradually mixing with the surface soil, and when plowed in wet weather is apt to bake. The growth is red, white, post, and Spanish oaks, chestnut, hickory, pine, poplar, gum, ash, birch, and elm. The soil is best adapted to cotton, though all crops do well, and the peach and grape are profitably cultivated. Cotton, comprising 50 per cent. of the crops, grows to an average height of 3 feet, and yields 1,000 pounds of seed-cotton per acre on fresh lands, with middling lint. After six years' cultivation the product is

600 pounds per acre, and 1,545 pounds are required for 475 pounds of lint. Rag-weeds and crab-grass are most troublesome. Ten per cent. of these lands now lie out, and, as they usually grow up in sedge-grass, they soon are as good as when fresh. No damage is done by the washing or gullying of the uplands.

The *red lands*, which are interspersed with the gray and have the same growth, have a red-clay loam soil, from 3 to 10 inches in depth, over a red and stiff clay subsoil. Cotton is planted to the extent of 50 per cent., grows to 3 feet in height, and yields 800 pounds of seed-cotton per acre on fresh land and 500 pounds after six years' cultivation. Rag-weed, crab-grass, and May-pop vines are most troublesome. Ten per cent. of these lands also lie out, but produce finely after a rest. These red uplands do not wash much.

The *mulatto lands*, or a mixture of the red and gray, have the same growth as above. Cotton grows to a height of from 3 to 5 feet, but is most productive at 4 feet, and yields 1,200 pounds of seed-cotton per acre on fresh land and 1,000 pounds after six years' cultivation. Five per cent. of these lands now lies out. Cotton is sold, as soon as ginned, at Griffin or other stations.

HENRY.

Population: 14,193.—White, 7,961; colored, 6,232.
Area: 400 square miles.—Woodland, all; metamorphic, all.
Tilled lands: 73,583 acres.—Area planted in cotton, 35,730 acres; in corn, 21,903 acres; in wheat, 7,406 acres; in oats, 5,321 acres; in rye, 44 acres.
Cotton production: 10,930 bales; average cotton product per acre, 0.31 bale, 435 pounds seed-cotton, or 145 pounds cotton lint.

Henry county is rolling and hilly, the streams all flowing eastward from the Atlantic and Gulf water-divide, which crosses the southwestern corner of the county. The lands are almost entirely granitic, with gray sandy and gravelly soils, associated with patches, and a few narrow belts of red sandy clays or mulatto lands. At Locust Grove, McDonough, and northward are found areas of red lands, derived largely from the biotite mica of the rocks, while over the rest of the county these spots are abundant.

Of the lands of the county 1⅔ per cent. is said to be too broken and 3 per cent. too swampy for tillage. It is thought that 68 per cent. of the original timber growth has been removed. The lands under cultivation embrace 28.7 per cent. of the county area, and of this 48.6 per cent. is in cotton, the chief crop, its average being 89.3 acres per square mile.

ABSTRACT FROM THE REPORT OF J. A. C. WYNN, OF WYNN'S MILL.

The lands of the county may be classed as follows: Gray sandy and red uplands, with a small area of sandy bottoms. The *sandy and gray uplands*, comprising one-half of the county area, with a stiff clay subsoil and a growth of red and post oaks and hickory, are best adapted to cotton and corn, one-half of the cultivated lands being devoted to the former. The uplands wash readily, injuring the valleys slightly. Very little of the land now lies idle, as the old lands are found to produce very well by the application of 100 pounds of guano per acre. Fresh lands yield 800 pounds of seed-cotton per acre. The lint rates as good middling. After ten years' cultivation the yield is 500 pounds, with low middling staple; 1,545 pounds are then required to make 475 pounds of lint. Rag-weeds are most troublesome.

The *bottom lands* have a growth of poplar, sweet gum, white oak, and beech, and are best adapted to corn, but little cotton being planted on them.

Cotton is sold to local buyers.

NEWTON.

Population: 13,623.—White, 6,740; colored, 6,883.
Area: 260 square miles.—Woodland, all; metamorphic, all.
Tilled lands: 65,039 acres; area planted in cotton, 27,801 acres; in corn, 17,112 acres; in wheat, 4,892 acres; in oats, 4,999 acres; in rye, 36 acres.
Cotton production: 7,796 bales; average cotton product per acre, 0.28 bale, 399 pounds seed-cotton, or 133 pounds cotton lint.

Newton county, through the center of which flows the Yellow river and other parallel streams, all flowing southward into the South river, has a slightly rolling surface.

That portion of the county east of Covington to within 4 miles of Rutledge has chiefly sandy red clay lands, produced from the decomposition of biotite gneisses, which are the prevailing rocks. From Covington westward to Rocky Plains a gray sandy soil predominates, with yellow or red subsoils; while still farther westward are gray granitic lands, with flat outcrops of the rock. The granite is fine grained, and is much used for building purposes. These various belts extend north and south through the county parallel with the streams.

There are in the county cotton and woolen mills, and flour, corn, and lumber mills are abundant. Sixty-three per cent. of the tillable land is said to have been cleared. Of the total area 39 per cent. is under tillage. Cotton is the chief crop, with an average of 106.9 acres per square mile, or 42.8 per cent. of the tilled lands. Its average product per acre is very low.

ABSTRACTS FROM THE REPORT OF L. F. LIVINGSTON, OF COVINGTON, AND JESSE W. WALKER, OF SOCIAL CIRCLE.

Cotton is not grown on the lowlands, as it will not mature and is killed by frost. The soil of the bottoms is a black loam, underlaid by whitish clay.

The cotton lands of the county may be classed as (1) a stiff red clay soil and subsoil, filled with gravel; (2) a light sandy soil, with clay subsoil, free from gravel; (3) a mulatto clay soil, free from gravel. Of these the *red clay uplands* are chiefly devoted to cotton, which comprises half of the crops. They have a coarse gravelly clay soil, 3 inches deep, a red-clay subsoil, gravelly and very productive when turned up a few months before cultivation; the growth is post, red, and black oaks, hickory, and pine. These lands extend from Covington 60 miles south, 70 miles east, and 40 miles north. They are early, warm, and well drained, easy to cultivate in dry but difficult in wet weather, and are best adapted to cotton. The cotton-plant grows to a height of from 15 to 24 inches, but runs to weed with

excessive rains, which is prevented by very shallow plowing and fertilizing with ammoniated fertilizers. Fresh lands yield 800 pounds of seed-cotton per acre. Its lint rates as middling. Ten years' cultivation without rotation or care of the soil reduces the yield to 400 pounds, but with a better staple. The older the land the better the staple, a good staple requiring a slow growth. "Crop" grass, a variety peculiar to this soil, is most troublesome to the crops. Hog-weeds appear after crops of wheat and oats. "Poor Peter" is also a troublesome weed. But very little red land now lies out; all is reclaimed and in cultivation. The uplands, and sometimes the valleys, are seriously injured by the washing and gullying of the soils, but some valleys are improved 50 per cent. Hillside ditching and horizontalizing are practiced to prevent injury, and with good success when properly done.

The *sandy gray soils*, extending west from Covington, have a growth of oak, chestnut, and pine, a depth of 5 inches, and an orange-red clay subsoil, not productive when turned up with the soil. The soil is early, warm, and well drained, easy to cultivate in dry and wet seasons, and is best adapted to cotton and potatoes. About one-half the cultivated lands is devoted to cotton, which grows to a height of from 10 to 18 inches and yields 600 pounds of seed-cotton per acre on fresh land. Ten years' cultivation reduces this to 300 pounds. The land is injured by washings, but the valleys are not much damaged.

The *mulatto lands* cover a very small portion of the county in a narrow belt reaching south, with a growth of hickory and oak. The brown or mulatto clay soil has a depth of from 4 to 6 feet, and is best adapted to cotton, which comprises two-thirds of the crops and grows to a height of from 2 to 4 feet, yielding 1,200 pounds of seed-cotton per acre on fresh land and 800 pounds after ten years' cultivation. Rag-weeds are most troublesome. One-eighth of these lands now lies turned out, but will produce well when again taken in. They do not wash or gully as readily as the gravelly clay lands.

The cultivation of cotton in this county has increased rapidly in the past ten years, owing to the use of fertilizers and to improved preparation and cultivation.

Shipments of cotton are made from Covington to Atlanta and to Augusta.

MORGAN.

Population: 14,032.—White, 4,249; colored, 9,783.

Area: 400 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 82,315 acres.—Area planted in cotton, 35,243 acres; in corn, 22,510 acres; in wheat, 4,980 acres; in oats, 4,017 acres; in rye, 111 acres.

Cotton production: 7,358 bales; average cotton product per acre, 0.21 bale, 297 pounds seed-cotton, or 99 pounds cotton lint.

Morgan county is hilly, and has a gradual fall from the west to the Oconee river on the southeast, all the streams flowing in that direction. The Georgia railroad passes through the center of the county almost east and west.

A broad belt, in which red lands predominate, passes north and south, extending in width from 4 miles east of Rutledge eastward to 1½ miles east of Madison, where gray sandy lands appear. Other narrow belts are found beyond this, and over the southern part of the county the red lands are very prevalent. These lands are formed from granites in which biotite gneiss is a large constituent, and which gives to the former their red character.

The gray lands of the northeast part of the county, and also on the east of Sugar creek, are very gravelly, and abound in quartz fragments, differing in that respect from the gray sandy lands on the west and south.

It is estimated that 5 per cent. of the county area is too hilly for successful cultivation, and that 2 per cent. consists of irreclaimable swamp lands. Some of the uplands between the streams present broad level areas, which are choice lands for cultivation; 62½ per cent. of the original forest has been cleared. The crops of the county are cotton, oats, corn, potatoes, and wheat.

There are in the county a cotton factory, carriage and wagon factories, and flour, corn, and lumber mills.

Lands under tillage embrace 32.2 per cent. of the county area. Cotton has an average of 88.1 acres per square mile, or 42.8 per cent. of tilled lands. The average product per acre of cotton is very small.

ABSTRACT FROM THE REPORT OF GRANT D. PERRY, OF MADISON.

The lands vary greatly from one stream to another, but may be generally classed as follows: Dark red loam, 4 inches deep, with red subsoils, and covering half of the county; gray sandy lands, 3 inches deep, with red subsoils, comprising 40 per cent. of the area; alluvial river lands or bottoms, comprising 10 per cent. of the area.

The *red lands* have a growth of oak, hickory, chestnut, poplar, gum, ash, and persimmon. Cotton comprises 60 per cent. of the crops on this soil, grows from 3 to 6 feet high, runs to weed in wet weather unless prevented by plowing close to the stalk, and yields from 800 to 1,000 pounds of seed-cotton per acre. The lint rates as good middling. After twenty years' cultivation the yield is diminished to 450 pounds. Crab-grass is most troublesome. Forty per cent. of these lands now lie turned out and are much injured by washing, which also damages some of the valleys.

The *gray lands*, having a growth of oak, hickory, chestnut, persimmon, and pine, are best adapted to cotton and oats, and are late and easy to cultivate. Seventy per cent. of cotton is planted on them. It grows to a height of from 2 to 4 feet, yielding 1,000 pounds of seed-cotton per acre on fresh land and 450 pounds after twenty years' cultivation.

The *bottom alluvial lands* along the creeks and large streams have a width of from 100 to 600 yards and a growth of gum, willow, alder, poplar, and oak. They have a clay loam soil from 10 inches to 10 feet in depth and a blue clay subsoil. The soil is late and somewhat difficult to till in wet seasons, and is best adapted to corn and oats. Cotton on these bottom lands is liable to be too late for full maturity. It grows to a height of from 4 to 7 feet, is most productive at 4 feet, and runs to weed in wet weather, which is prevented by plowing near the stalk and breaking the roots. Its yield on fresh land is 1,200 pounds of seed-cotton per acre, and after twenty years' cultivation the yield is 600 pounds, provided the uplands have not washed down and covered up the good soil with sand. Crab-grass gives most trouble on these bottoms. About 30 per cent. of the land lies out, but it produces well when again taken in.

Dry weather is a great drawback to the growth of upland cotton. The land is so poor that it must be stimulated with commercial fertilizers, which add so much to the cost that without good seasons there is no profit. Shipments are made by railroad to Augusta.

366

GREENE.

Population: 17,547.—White, 5,573; colored, 11,974.
Area: 340 square miles.—Woodland, all; metamorphic, all.
Tilled lands: 91,224 acres.—Area planted in cotton, 40,037 acres; in corn, 25,827 acres; in wheat, 6,473 acres; in oats, 6,674 acres; in rye, 92 acres.
Cotton production: 12,448 bales; average cotton product per acre, 0.31 bale, 444 pounds seed-cotton, or 148 pounds cotton lint.

The surface of Greene county along the Oconee river is very hilly, with steep ascents from the river, but eastward the slopes are more gentle.

In the southeastern part of the county there is a large granitic area, in which the rocks appear in immense bowlders, having coarse feldspar crystals and forming gray gravelly soils. The granitic section extends westward to Richland creek, northwest to within one mile of Greensboro', and thence eastward.

A wide belt of red clay lands from hornblendic gneiss borders the granitic region, passing through Union Point, Greensboro', and thence southward. Westward from this to the river on the west, and northward for several miles, are gray sandy lands, with a few granite outcrops, interspersed with small areas of red lands. In the northern part of the county the red lands again predominate. (See analyses of soils, pages 33 and 35.)

It is thought that 58 per cent. of the county (originally timbered with oak, hickory, and pine) has been cleared. At present, however, but 41.9 per cent. of the total area is under tillage. Cotton is the chief crop, and averages 117.8 acres per square mile, or 44.9 per cent. of the tilled land. In the former regard the county ranks as seventh in the state, but in product per acre it is very low.

ABSTRACT FROM THE REPORT OF J. B. Y. WARNER, OF GREENSBORO'.

The *gray sandy uplands*, covering two-thirds of the county, are the chief cotton lands. They have sometimes a whitish, but usually red clay subsoil. The cotton stalk grows to a height varying from 6 inches to 6 feet, and is most productive at 2 or 3 feet. It runs to weed on red and rich lands during wet weather. Crab-grass, rag-weed, etc., give the crops much trouble. The lands produce from 1,000 to 1,500 pounds of seed-cotton when fresh. In some cases the yield in ten years is not more than half of this. About one-half of the lands originally under cultivation now lies out, and, if not washed much before turning out, yields a fair crop when again taken in. Some of the valleys and uplands are ruined by the washing of the latter; deep plowing is in rare instances practiced to prevent it, and with good success. The growth of the uplands is oak, hickory, chestnut, poplar, pine, dogwood, and black and sweet gums.

Shipments are made, via Augusta, to Charleston and to Savannah by rail.

TALIAFERRO.

Population: 7,034.—White, 2,312; colored, 4,722.
Area: 180 square miles.—Woodland, all; metamorphic, all.
Tilled lands: 46,616 acres.—Area planted in cotton, 14,058 acres; in corn, 9,901 acres; in wheat, 3,086 acres; in oats, 4,305 acres; in rye, 34 acres.
Cotton production: 4,758 bales; average cotton product per acre, 0.34 bale, 483 pounds seed-cotton, or 161 pounds cotton lint.

Through Taliaferro county there passes a ridge in an easterly course, dividing the tributaries of the Little river and of the Ogeechee, and marked by the Georgia railroad. Crawfordville, situated on this ridge, has an elevation of 618 feet above the sea.

The general surface of the county is rolling, with granites on the southwest, center, and northeast, clay-slates on the east of Crawfordville toward Raytown, and hornblendic rocks on the north, each with their characteristic gray gravelly, gray clayey, and red clay or mulatto lands.

The crops of the county are corn, cotton, wheat, oats, and sorghum. The entire county is tillable, and 50 per cent. of the original timber growth is thought to have been removed. The tilled lands comprise 40.5 per cent. of the total area, cotton being the chief crop, with an average of 78.1 acres per square mile.

ABSTRACT FROM THE REPORT OF LIONEL L. VEAZEY, OF CRAWFORDSVILLE.

The cotton lands of the county are classed as red, mulatto, and gray, and are all adapted to corn and cotton. Cotton comprises half the crops, grows to a height of from 3 to 5 feet, and yields 800 pounds of seed-cotton per acre (sometimes more) on fresh land. After three years' cultivation the yield is only 600 or 800 pounds per acre, 1,545 pounds of seed-cotton making 475 pounds of lint, which rates as first-class from new lands and a little lower from old. Carrot- and hog-weeds are most troublesome. One-fourth of the lands now lies out; after fifteen or twenty years' rest they produce almost as well as fresh lands. The uplands wash readily and are seriously damaged, but the valley lands are rather improved.

Shipments of cotton are made to Augusta.

LINCOLN.

Population: 6,412.—White, 2,254; colored, 4,158.
Area: 280 square miles.—Woodland, all; metamorphic, all.
Tilled lands: 37,813 acres.—Area planted in cotton, 12,798 acres; in corn, 11,029 acres; in wheat, 2,125 acres; in oats, 7,035 acres; in rye, 13 acres.
Cotton production: 3,861 bales; average cotton product per acre, 0.30 bale, 429 pounds seed-cotton, or 143 pounds cotton lint.

The surface of Lincoln county is rolling and hilly, the most prominent point being Graves' mountain, on the west. A belt of granite extends through Lincolnton to the mountain, and another outcrop is found in the southwestern corner of the county, both forming gray sandy and gravelly soils. Over the rest of the county the red clayey and gray sandy lands are found in alternating belts. About 2½ per cent. of the area is too hilly or broken for cultivation. (See analysis of soil, page 37.)

Gold is being mined extensively. Graves' mountain is composed of a soft, friable sandstone, containing crystals of rutile, etc.

The drainage of the county is to the Savannah river. It is estimated that 37 per cent. of the original timber growth has been cleared; 21.1 per cent. of the total county area is under cultivation in corn, wheat, cotton, oats, and potatoes. Cotton is the chief crop, with an average of 45.7 acres per square mile, or 33.9 per cent. of the tilled lands.

The following experiment was reported by J. M. Dill, of Clay Hill, to the Georgia department of agriculture:

The land was a sandy loam, with clay subsoil, and had been in cultivation sixty years. The original growth was white and red oaks, hickory, etc.; had been lightly manured previous to 1879. Without fertilizers the yield was 665 pounds per acre; with fertilizers and compost, from 935 to 1,470 pounds of seed-cotton.

Another plat in the same field the following year gave, without additional fertilizers, 665 pounds average per acre; with fertilizers and composts, from 1,085 to 1,295 pounds of seed-cotton.

ABSTRACTS FROM THE REPORTS OF C. R. STROTHER AND N. A. CRAWFORD, OF LINCOLNTON.

Cotton is planted here on the uplands and bottoms. The upland is the surest for a crop, is planted earlier and matures faster, and is not so liable to rust as the sandy bottoms. The loamy bottoms with favorable seasons sometimes yield 1,500 pounds of seed-cotton per acre, but because of the better yield of corn on these lowlands they are but little devoted to cotton. From one-third to one-half of the uplands under cultivation is devoted to cotton.

Of the uplands the *gray sandy lands* having red-clay subsoils are best for cotton, and those are selected which are on southern slopes of hills, being more exposed to the rays of the sun in the spring and better protected from frosts and cold winds. The growth of these lands is post oak, black-jack, and hickory. The soil has a depth of about 6 inches to a stiff red-clay subsoil. The rocks are decomposed or disintegrated to a depth of 20 or 30 feet. The soil is early, warm, well drained, and easy to till, and is best adapted to cotton and oats. The former grows to a height of 3 feet, and runs to weed on fresh lands in wet weather, unless prevented by using stable manure, either in drill or broadcast. On fresh lands the yield is from 600 to 1,000 pounds of seed-cotton per acre, which is reduced to 500 pounds in five years' cultivation if not alternated with wheat or oats, 1,425 pounds from fresh and 1,545 from old lands making 475 pounds of lint, the staple in the former sometimes rating higher and bringing in market 1 cent more per pound. Crab-grass is the most troublesome on these gray lands. Seven-tenths of these lands originally in cultivation now lie out, and have a growth of old-field pine. They do not produce well when taken in again without the use of fertilizers. The valleys would be injured 50 per cent. by the washing and gullying of the gray uplands if a system of ditching or draining were not kept up by the best class of farmers.

The *red clay lands* also have a growth of oak and hickory and a subsoil of tough red clay, mixed with yellow streaks, yielding readily to a good two-horse subsoil plow. The soil is early when well drained, and is not difficult to work either in wet or in dry seasons, and all the crops succeed well if they receive proper attention. Cotton grows to a height of 30 inches, yielding 1,000 pounds per acre in dry seasons. In these clay lands, when the plant is inclined to run too much to weed, the use of superphosphates seems to check it and favor bolling. After five years' cultivation the yield is 400 or 600 pounds, the lint becoming lighter and the staple not so long. Rag- and hog-weeds are most troublesome on these clay soils; other varieties are easily subdued. About one-third of these lands now lies out, producing better cotton crops than when fresh when again taken in.

Gray gravelly soils.—Interspersed with the red and gray varieties are gray sandy soils having a yellow or black gravel, with much quartz. The depth is 3 or 4 inches, with a yellowish-white sand, very porous and miry in wet weather. This is underlaid by sand and gravel. This soil is adapted to corn and oats; cotton grows to a height of 3 feet, and yields 700 pounds of seed-cotton per acre when fresh and 300 or less after five years' cultivation.

Shipments of cotton are made, by wagon and by boat, to Augusta at $2 per bale.

WILKES.

Population: 15,985.—White, 5,173; colored, 10,812.

Area: 460 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 88,776 acres.—Area planted in cotton, 30,891 acres; in corn, 21,493 acres; in wheat, 4,287 acres; in oats, 11,855 acres; in rye, 463 acres.

Cotton production: 11,109 bales; average cotton product per acre, 0.36 bale, 513 pounds seed-cotton, or 171 pounds cotton lint.

The surface of Wilkes county is undulating and broken, the dividing granite ridge extending east and west through the middle of the county. The soil of this ridge is gray and sandy, and reaches southward over most of the county. To the northward there is a belt of alternating red clays and sands, the former apparently predominating. This belt has a southward course from Elbert county, and a width of but a few miles. Good clay subsoils underlie all of the county lands. A small part of a flatwoods belt lies still northward, on the county-line, and is a continuation of the flatwoods of South Carolina. The prominent growth of this belt is black-jack; the growth elsewhere is oak, pine, and hickory.

The bottom lands are narrow and sandy, and where above overflow are devoted chiefly to the culture of corn, owing to the liability of injury to cotton crops by rot and frosts. About one-third (30.2 per cent.) of the county area is now under cultivation, and 20 per cent. is said to consist of worn-out lands now lying out and covered with a growth of old-field pine. A small percentage also consists of irreclaimable swamp and of lands too broken for tillage.

Cotton is the chief crop, comprising 34.8 per cent. of the tilled lands, and averaging 67.2 acres per square mile. Its product per acre is greater than that of either the region or state at large.

ABSTRACT FROM THE REPORT OF JOHN T. WINGFIELD, OF WASHINGTON.

The lands are quite variable within very short distances, and "spotted" might be a good term to apply to them, as very fine and very poor lands are contiguous, or within a few hundred yards of each other. They may be classed as red, gray, and sandy.

The *red clays* are the best lands. Their soils are 4 inches deep, with a red-clay subsoil, and rock at 10 feet. The lands seem to be best for oats, though cotton forms two-thirds of the crops. Fresh lands yield 800 pounds of seed-cotton per acre. The seeds of the first picking are heavier than those of subsequent ones, and hence from 1,425 to 1,780 pounds are required to make 475 pounds of lint. Cultivation of ten years (unmanured) reduces the yield to 200 pounds of seed-cotton, and the staple is much shorter. Hog-weeds are most troublesome. One-third of the red lands originally under cultivation now lies out. These lands produce freely for only three years after being again taken in, but wash readily, and are much injured.

The *gray lands*, with their 3 inches of fine sandy and gravelly soils and yellow and white clay subsoils, are the chief cotton lands of the county. Cotton planted on fresh land yields 1,000 pounds of seed-cotton per acre. Ten years of cultivation (unmanured) reduces this yield to 300 pounds, but the staple is longer, thus differing from that of the red lands.

The *flatwoods* of the upper part of this county and in the adjoining counties of Elbert and Oglethorpe have a black soil with a yellow-clay subsoil, producing all the cereals finely and continuously, making cotton successfully from 4 to 6 years after clearing, but after that producing a sufficiency of weed but no bolls, and being ruined by rust.

Shipments of cotton are made to Augusta, per railroad, at 32 cents per 100 pounds.

COLUMBIA.

Population: 10,465.—White, 3,030; colored, 7,435.

Area: 290 square miles.—Woodland, all; sand hills, 70 square miles; metamorphic, 220 square miles.

Tilled lands: 54,362 acres.—Area planted in cotton, 25,302 acres; in corn, 15,632 acres; in wheat, 1,095 acres; in oats, 3,804.

Cotton production: 8,313 bales; average cotton product per acre, 0.33 bale, 468 pounds seed-cotton, or 156 pounds cotton lint.

The face of Columbia county is much broken, 1 per cent. being too broken for successful tillage; 2½ per cent. is of irreclaimable swamp, and of the rest 70 per cent. is said to have been cleared. On the south, and covering probably one-fourth of the county, are the sandy pine hills of the "central cotton belt", with a predominant growth of long-leaf pine, the northern limit being several miles north of Sawdust, and at the Richmond county-line on the southeast. The rest of the county lies within the metamorphic region.

On the southeast, and extending north along the river above the mouth of Kiokee creek, are the cold clay lands of the siliceous "clay-slate" region, a continuation westward of that region in South Carolina, and limited by the granite lands around Appling, the county-seat. These latter are comprised within an area extending 3 miles north, 5 miles southwest and northeast, and 4 miles south of the town.

Flat exposures are common, the largest being reported to cover 125 acres. Red clay lands are found north of this section, forming narrow belts, and intermixed with the dark-sandy soils of feldspathic gneisses. The lands under cultivation embrace 29.3 per cent. of the total county area, and of these 46.5 per cent. are in cotton, the average of this crop being 87.2 acres per square mile. Its product per acre is that of the region at large.

ABSTRACT FROM THE REPORT OF HON. H. R. CASEY, M. D., OF APPLING.

Cotton is cultivated on all classes of land, but experience gives the preference to the *gray or light sandy and mulatto*, which has a depth of 3 or 5 inches and a subsoil varying from deep red clay to yellow sandy clays, with pipe-clay in small spots. The growth is oak in its varieties, hickory, walnut, sassafras, persimmon, and short-leaf pine. These lands being warm, early, well drained, and easiest to cultivate, are best suited to cotton, which comprises one-half of the crops. The yield is 800 pounds of seed-cotton per acre, the lint rating as good middling. Cultivation of five years reduces the yield to 600 pounds, but otherwise produces no change. The stalk grows to an average height of 3 feet, its tendency to run to weed when crowded and in wet weather being checked by shallow cultivation but deep preparation of the land. The crops are troubled with hog-weed, May-pop vines, sheep-sorrel, crab-grass, etc. When the lands are coarse sandy, they wash very readily; otherwise but slightly. Considerable damage is done to the hills if too long neglected, while some of the valleys are much benefited by the deposits.

The *red clay lands*, from decomposed hornblendic rocks, cover about one-third of the county. The growth is oak, hickory, walnut, short-leaf pine, dogwood, and cedar. The soil is several feet in depth, there being but little perceptible difference in the subsoil. It is late and cold, and difficult to till in both dry and wet seasons. Its product on fresh land is 700 pounds of seed-cotton, and it fails faster than gray land. The unstained staple rates as good middling.

The *light sandy, gravelly, crawfishy soils* cover but a small area, and have a growth of black-jack, chincapin, and scrub oak. Cotton grows to a height of only from 6 inches to 1 foot, and yields from 200 to 400 pounds of seed-cotton on fresh land, the product being still less after a few years. Small grain best suits these lands.

Shipments of cotton are made by rail or by wagon to Augusta.

McDUFFIE.

Population: 9,449.—White, 3,430; colored, 6,019.

Area: 330 square miles.—Woodland, all; sand hills, 107 square miles; metamorphic, 223 square miles.

Tilled lands: 54,381 acres.—Area planted in cotton, 24,819 acres; in corn, 13,935 acres; in wheat, 2,779 acres; in oats, 5,616 acres; in rye, 10 acres.

Cotton production: 7,439 bales; average cotton product per acre, 0.30 bale, 426 pounds seed-cotton, or 142 pounds cotton lint.

McDuffie county has its area about evenly divided between the metamorphic and the pine-hills regions, the line of separation passing 1 mile or 2 miles north of Thomson, and then turning southwestward into Warren county.

The upper or northern part of this county is rolling, with outcropping metamorphic rocks, which are filled with gold-bearing quartz veins along the Little river. The gray sandy lands predominate, the red, forming large areas, being intermixed with them. The entire county was once thickly timbered, but now about half is said to have been cleared. The metamorphic section has the usual oak and hickory growth, while the pine hills are covered with their characteristic long-leaf pine, black-jack, and sweet-gum growth.

The crops of the county are cotton, corn, wheat, oats, potatoes, and sugar-cane.

Lands under tillage comprise 25.7 per cent. of the county area, and of these 45.6 per cent. are in cotton, its average being 75.2 acres per square mile. The product per acre of the county is below that of the region.

In comparing the enumeration reports of production of cotton in this county it is found that the largest yield per acre is in the militia district occupying the central part. The results are as follows: The northern part of the county averages 420 pounds of seed-cotton; the central part, 510 pounds; the southwestern part, 405 pounds; the southeastern part, 495 pounds per acre. The greater productiveness of the southeastern pine hills over the gray sandy lands of the north is due, apparently, to the liberal use of fertilizers.

ABSTRACT FROM THE REPORT OF A. E. STURGIS, OF THOMSON.

The lands of the county may be classed as dark-gray sandy, with clay subsoil, which are preferable for cotton; mulatto or red lands, also well adapted to cotton; sandy or pine lands, inferior to either of the others. Crops on the bottom lands are liable to be caught by frosts, and are also more subject to the boll-worm, to rust, and to rot than on the uplands; hence these lands are but little under cotton cultivation. These lowlands comprise the marshy, sweet-gum, and gallberry flats of the pine-hills region.

The *dark-gray soils*, comprising three-eighths of the lands of McDuffie, are from 4 to 12 inches deep, with a tough, yellow clay subsoil and a growth of post oak, big-bud hickory, and dogwood, with some red oak. One-third is planted in cotton. The plant grows to a height of from 1 foot to 4 feet, but is most productive at 3 feet, yielding from 800 to 1,200 pounds of seed-cotton per acre on fresh land. After ten years' cultivation the yield is from 400 to 600 pounds. From fresh lands 1,425 pounds make 475 pounds of lint, which rates as middling to good middling; from old lands 1,485 pounds are required for a bale, the lint rating as low middling to middling. The crops are troubled most with crab-grass. But little land lies out, and when taken in again it produces as well as at first. The gray uplands wash readily, and in some localities serious damage is done to them. The valleys, too, become filled up with sand, which injures their productiveness. Ditching is practiced with success in preventing this washing.

The *red lands*, covering one-third of the county, have clay loam soils 1 foot or 2 feet deep, a red clay, putty-like subsoil, a growth of oak, hickory, dogwood, poplar, and walnut, and are best adapted to wheat, oats, rye, and barley, though one-third is planted in cotton. The stalk of the latter runs to weed in wet weather and from deep plowing, unless restrained by topping and plowing shallow with a sweep. It yields on fresh land from 1,000 to 1,500 pounds of seed-cotton per acre, and from 600 to 800 after ten years' cultivation unmanured. Hog-weeds are most troublesome. Though washing readily, but little serious damage is done to the uplands, and none to the valleys.

The *pine lands* of the southern part of the county have a coarse sandy and gravelly soil from 1 foot to 2 feet deep, a yellow subsoil, underlaid with "chalk" (white pipe-clay) 10 feet below, and a growth of long-leaf pine, black-jack, and sweet gum, with black gum and poplar on the swamps. On the hills are red ferruginous pebbles. The lands are best adapted to pease, potatoes, and melons, though one-eighth is planted in cotton. Cotton grows to a height of 2 feet, and yields from 600 to 800 pounds of seed-cotton on fresh lands. Ten years' cultivation reduces this to 200 pounds. Crab-grass is most troublesome. A small proportion of these lands now lies out. They wash readily, suffering serious damage in some localities, and frequently render the valleys unfit for cultivation. Hillside ditching is practiced on every farm, and is very successful in preventing damage.

Shipments of cotton are made to Augusta at 1.5 cents per pound or 75 cents per bale.

WARREN.

Population: 10,885.—White, 4,039; colored, 6,846.

Area: 290 square miles.—Woodland, all; sand hills, 98 square miles; metamorphic, 192 square miles.

Tilled lands: 53,966 acres.—Area planted in cotton, 24,991 acres; in corn, 16,450 acres; in wheat, 3,649 acres; in oats, 4,885 acres.

Cotton production: 7,885 bales; average cotton product per acre, 0.32 bale, 447 pounds seed-cotton, or 149 pounds cotton lint.

Warren county lies partly in the metamorphic and partly in the pine- and sand-hills region, the two divisions differing greatly in surface features. The water-divide between the Savannah and Ogeechee river systems passes slightly northwestward through the county.

The metamorphic region extends southward to 6 miles beyond Warrenton, and on the creeks its rocks are exposed much farther south. The red and gray sandy lands occur in the north and northwest, granitic (pink feldspar) lands at Warrenton and southward, and gray clay lands at Camak.

The southern part of the county is covered with white sands and clays of the pine hills, and has a growth of long-leaf pine and black-jack.

The surface of the entire county is well timbered, rolling, and broken, but all considered tillable, and 29.1 per cent. is under cultivation in cotton, corn, wheat, oats, potatoes, etc.

There is but little bottom land on the creeks of the northern portion of the county. Cotton is the chief crop, and has an average of 86.2 acres per square mile, or 46.3 per cent. of the tilled lands.

ABSTRACTS FROM THE REPORTS OF JAMES A. SHIVERS AND JOHN S. JOHNSON, OF WARRENTON.

The soils of Warren county may be classed as red clay lands, rocky and rolling; light gray lands, rolling, and with a clay subsoil; and fine sandy table-lands of the pine hills.

The *red clay lands* are considered the best land of the county for crops in general. They comprise about one-third of its area; have a depth of from 4 to 6 inches, a red and yellow clay subsoil, very tough, but when properly worked in season are easy to manage. The growth is oak and hickory. The soil is difficult to till in wet but easy in dry seasons. One-third of the soil under cultivation is devoted to cotton.

The plant grows to a height of from 12 to 36 inches, and runs to weed with too much rain in June and July. It yields on fresh land from 800 to 1,000 pounds of seed-cotton per acre. After two years the yield is 1,200 pounds; four years, from 700 to 1,000; six years, from 600 to 900; and after ten years, from 500 to 800 pounds. Hog-weeds and crab-grass are most troublesome. From one-third to one-half of the land lies out. When again taken in these lands make better cotton for a few years, and are preferred, as they are easier cultivated. The uplands are seriously damaged by washing, but the valleys are improved from 10 to 20 per cent. Horizontalizing is practiced with success in checking the damage and in reclaiming old hillsides.

The *gray lands*, with red subsoils at a depth of from 4 to 18 inches, lie away from the water-courses, and have a growth of oak, hickory, ash, gum, maple, and pine. The lands are best adapted to cotton, and comprise one-third of the area of the county. The average height of cotton is 24 inches, and it yields from 1,000 to 1,200 pounds of seed-cotton per acre on fresh land. Cultivation of cotton for four years reduces this yield to 1,000 pounds, and for six years from 600 to 800 pounds.

The *sandy piny woods* of the southern part of the county cover one-third of its area, and have, besides the pine, a growth of black-jack. The soil is from 1 foot to 10 feet deep to a white clay. It is easy to till, early, warm, and well drained, and is best adapted to corn, wheat, and oats. On this land cotton grows to a height of 4 feet, and yields from 400 to 600 pounds of seed-cotton per acre. Cultivation of two years reduces this to 300 or 400; six years, to 200 or 300 pounds. One-third of this land now lies turned out, and is greatly improved by rest. These light and sandy uplands wash readily and do serious damage, but the valleys seem to be improved by the deposit of sand.

Fourteen hundred and twenty-five pounds of seed-cotton on all the lands of the county make 475 pounds of lint, except on the old lands of the pine hills, where 1,545 pounds of seed-cotton are required.

Shipments are made to Augusta by railroad at $1 20 per bale.

HANCOCK.

Population: 16,989.—White, 5,044; colored, 11,945.

Area: 520 square miles.—Woodland, all; sand hills, 132 square miles; metamorphic, 388 square miles.

Tilled lands: 99,397 acres.—Area planted in cotton, 42,773 acres; in corn, 33,328 acres; in wheat, 5,913 acres; in oats, 6,503 acres; in rye, 120 acres.

Cotton production: 15,010 bales; average cotton product per acre, 0.35 bale, 501 pounds seed-cotton, or 167 pounds cotton lint.

Hancock county is one of the border counties whose area embraces partly metamorphic and partly pine and sand-hills regions, with soils of greatly different character. The surface is mostly rolling, especially in the metamorphic portion of the county, which embraces the greater area, and which extends in width from the northern county-line to several miles south of Sparta. On the south the lands are more level, and embrace the sandy pine uplands. The Ogeechee and Oconee water-divide passes northward through the county, these two streams forming, respectively, the eastern and western boundaries.

In the metamorphic or northern section of the county there are two granitic regions: one a narrow strip on the north, next to Greene county; the other, of the pink feldspathic variety, in the region of Sparta, extending in a belt northeast and southwest. Long-leaf pine is a prominent growth on its gray sandy lands. Between these two granitic regions the lands are gray and more or less rocky, a red-clay subsoil usually underlying the surface at 6 to 12 inches. (See analysis of soil, page 37.)

The red lands pass across the county in a rather narrow northeasterly belt 4 miles north of Sparta and just south of the northern granite area. Its growth is chiefly oak and hickory.

The sand and pine hills of the southern part of the county embrace sandy ridges and level uplands, with often deep sand beds covering plastic and variegated clays. Long-leaf pine is a prominent growth of this region. The entire surface of the county is considered tillable, and it is thought that 56 per cent. of the original growth has been removed. The tilled lands embrace 29.9 per cent. of the total area, and are chiefly (43 per cent.) devoted to cotton, its average being 82.3 acres per square mile. The county ranks as eleventh in the state in its total acreage of cotton. The following experiment with fertilizers was made by John Turner, of Culverton, on gray sandy land:

The land has been in cultivation about sixty years and has been manured. The original growth was oak and hickory. The yield without fertilizers was 595 pounds of seed-cotton per acre. With commercial fertilizers and composts it ranged from 1,015 to 1,260 pounds of seed-cotton.

ABSTRACT FROM THE REPORT OF W. J. NORTHEN, OF SPARTA.

The culture of cotton in this county is confined almost exclusively to the uplands. Cotton fails to open on bottoms, and but few persons attempt to raise it on such land.

The uplands may be classed as darkish gray, mulatto, and red lands. The *gray land* is the chief cotton land, and covers one-third of the area of the county; has a depth of 4 or 5 inches, a mulatto or red subsoil, and a growth of oak and hickory. The crops of the county are cotton, corn, oats, wheat, potatoes, etc. The gray land is chiefly devoted to cotton, the red to small grain. Three-fourths of the land now lies out, and if allowed to grow up in pines the yield for a few years is equal to three-fourths of that of fresh land. The sandy nature of the land is favorable to the rapid washing away of the soil on hillsides, by which serious damage is done, though the valleys are usually improved. Owing to carelessness in opening the hillside ditches very little success attends the attempts to check the damage.

Cotton comprises one-half the crops, fresh lands yielding nearly one bale per acre. The height to which the plant grows varies from 6 inches to 3 feet, a medium being most productive. The use of fertilizers favors bolling and prevents running to weed. After fifteen years' cultivation the yield is about 400 pounds of seed-cotton per acre. Indigo- and hog-weeds are most troublesome.

The *mulatto soils* differ but little in character from the gray. Cotton seems to come to maturity, but does not open until the frosts crack the bolls, and it is then too much damaged to bring a fair price in market. The subsoil is a heavy clay, and the land is hard to cultivate.

Shipments are made by railroad, via Sparta, to Augusta, immediately upon baling.

PUTNAM.

Population: 14,539.—White, 3,518; colored, 11,021.
Area: 360 square miles.—Woodland, all; metamorphic, all.
Tilled lands: 72,664 acres.—Area planted in cotton, 35,819 acres; in corn, 23,175 acres; in wheat, 2,855 acres; in oats, 2,881 acres; in rye, 93 acres.
Cotton production: 9,678 bales; average cotton product per acre, 0.27 bale, 384 pounds seed-cotton, or 128 pounds cotton lint.

Putnam county is hilly and rolling. Its streams all flow south and southeast, and unite with the Oconee river, which forms its eastern boundary.

A large proportion of the land is of a red clay or mulatto character, the gray sandy soils being found interspersed in large and small areas throughout. The rocks forming these lands are mostly biotite gneisses, with some granites and mica-schists. Hornblendic gneisses occur north of Dennis' station.

Very little of the surface of the county is too hilly for cultivation; 2½ per cent. is too swampy. The lands under cultivation, comprising 31.5 per cent. of the county area, are devoted to cotton, corn, wheat, oats, potatoes, etc.

Cotton is the chief crop, its acreage being 49.3 per cent. of the tilled lands, and averaging 99.5 acres per square mile. Its average product per acre is very low.

The following result of an experiment with fertilizers by J. T. Dennis, of Eatonton, is reported:

Mulatto land that had been lying turned out twenty-five or thirty years and had grown up in old-field pines was used. Original growth, oak and hickory. Average yield, without fertilizers, 463 pounds per acre; yield with 200 pounds of fertilizers, per acre, from 630 to 910 pounds of seed-cotton.

ABSTRACTS FROM THE REPORTS OF ROBERT C. HUMBER AND J. T. DENNIS, OF EATONTON.

The lands are nearly all of a uniform character, comprising deep-red clay, light gray, and light sandy pine lands.

The *deep-red clay lands* cover from three-fourths to four-fifths of the surface of the county, and extend 30 miles north and 20 south, and across the county east and west. The soil has a depth of 2 feet, and has a heavier red-clay subsoil, that bakes very hard after summer rains and is very clammy, absorbing moisture readily when pulverized. The growth is oak, hickory, ash, poplar, and pine. The lands are best adapted to cereals, though fully one-half is planted in cotton. Too much rain and too deep plowing cause the cotton-plant to run to weed. Its average height is 2½ feet. It yields about 1,000 pounds of seed-cotton per acre on fresh land, and 500 pounds after ten years' cultivation. In the latter the staple is much shorter, and 1,665 pounds of seed-cotton are required for 475 pounds of middling lint. Rag- and hog-weeds are most troublesome. Fully one-half of these lands now lies out. They produce well for the first two or three years when again taken in, but are much damaged by washing and gullying, and the valleys are injured to a considerable extent. Hillside ditching prevents damage, but the quickest and surest remedy is to plant Bermuda grass on the slopes.

The *light gray lands* suffer from rust. They comprise one-sixth of the area of the county, and have a growth of post oak and hickory. The subsoil is a light yellow clay, which is underlaid by clay. The greater part of the crops is of cotton, which grows to a height of 3 feet, and produces from 1,500 to 2,000 pounds of seed-cotton per acre on fresh land. Ten years' cultivation reduces this yield to 600 pounds. One-half of the land now lies out, being much damaged by washing away of the soil, and the sand damages the valleys very greatly. Hillside ditching meets with partial success.

The *light sandy pine soils* cover but a small area in the county. They are coarse sandy and gravelly, and of a whitish color. The bottom lands are sometimes injured by early frosts.

Cotton is either shipped to Savannah by railroad at 45 cents per 100 pounds, or to Milledgeville at 25 cents per 100 pounds.

BALDWIN.

Population: 13,806.—White, 4,512; colored, 9,294.
Area: 240 square miles.—Woodland, all; oak, hickory, and pine uplands, 12 square miles; sand hills, 138 square miles; metamorphic, 90 square miles.
Tilled lands: 61,464 acres.—Area planted in cotton, 27,832 acres; in corn, 17,599 acres; in wheat, 1,607 acres; in oats, 1,858 acres; in rye, 73 acres.
Cotton production: 7,921 bales; average cotton product per acre, 0.28 bale, 405 pounds seed-cotton, or 135 pounds cotton lint.

Baldwin county, one of the counties whose area embraces in part the metamorphic region on the north and in part the pine and sand-hills region on the south, has a rolling and hilly surface, drained by the Oconee river and its tributaries.

The metamorphic region reaches northward from Milledgeville, its rocks forming belts of gray sandy and red clay lands, all with red or yellow clay subsoils. A granite belt (pink feldspar) with gray sandy lands occupies its southern border, which has a width of several miles and extends northeast and southwest. Red clay lands, from (black mica) gneisses, cover large areas 4 miles north of Milledgeville. (See analysis, page 35.) From Milledgeville southward the pine hills, with their deep sandy soils and sand-beds, rise high above the metamorphic, and are covered with long- and short-leaf pine and an undergrowth of black-jack, with some other growth. Underneath the lands are heavy beds of white and variegated plastic and impervious clays.

It is thought that 62 per cent. of the original growth of the county has been removed. Tilled lands now comprise 40 per cent. of the county area, and are devoted to cotton, corn, small grain, potatoes, etc. Cotton is the chief crop, and averages 116 acres per square mile (45.3 per cent. of tilled lands), the county ranking eighth in the state in this regard. Its product per acre is, however, small. There is a large cotton factory in the county. (For experiment of Hon. F. C. Furman with fertilizers on worn-out land, see page 58.)

The following description of the region around Milledgeville is taken from "A visit to the United States", by Sir Charles Lyell, 1846:

It is striking, around Milledgeville, to see so many large detached and rounded bowlders of granite lying on the surface of the soil and all strictly confined within the limits of the granite region. One of these, on the slope of a hill 3 miles from the town, resting on gneiss, measured 12 feet in its largest diameter, and was 4 feet high.

The surprising depth of some of the modern ravines in the neighborhood of Milledgeville suggests matter of curious speculation. At the distance of 3½ miles west of the town is a ravine. Twenty years ago it had no existence, but when the trees of the forest were cut down, cracks 3 feet deep were caused by the sun's heat in the clay; and during the rains a sudden rush of water through these cracks caused them to deepen at their lower extremities, from whence the excavating power worked backward, till, in the course of twenty years, a chasm measuring no less than 55 feet in depth, 300 yards in length, and varying from 20 to 180 feet in width was the result. In the perpendicular walls of this great chasm appear beds of clay and sand, red, white, yellow, and green, produced by the decomposition, *in-situ*, of hornblendic gneiss, with layers and veins of quartz, and of a rock consisting of quartz and feldspar.

ABSTRACT FROM THE REPORT OF JAMES C. WHITAKER, OF MILLEDGEVILLE.

The lands of the county may be classed as light sandy uplands, with clay subsoil, and light isinglass (mica) lowland soils.

The *light sandy soil* comprises three-fourths of the lands of the county, and has a growth of pine, with scrub black oak and dogwood. The crops of the county, besides cotton, are oats, corn, and wheat, and this land is best adapted to the first two. Ten per cent. of the land now lies out, and produces well when taken in again if manure is used. The uplands are seriously damaged by washing, but the valleys are not injured. But few efforts are made to check the damage, hillside ditching meeting with poor success. One-half of the crops is of cotton, which grows to a height of 3½ feet, and yields 700 pounds of seed-cotton per acre, or an average of 200 pounds of lint, which rates as middling. After ten years' cultivation the land yields only 500 pounds of seed-cotton, the staple then being low middling. Crab-grass is most troublesome.

The *bottom lands* of the Oconee river are narrow in the upper part of the county, but widen out to the south, with a heavy growth of cottonwood, ash, and maple, and an undergrowth of cane. The soil is a light sandy, yellowish loam on the river and a dark mucky sand on the creeks, very deep, and well adapted to corn. It is warm, but ill drained, and is easily tilled. Cotton forms one-half of the crops, growing to a height of from 5 to 6 feet, producing 1,200 pounds of seed-cotton when fresh. It is improved by ten years' cultivation, its yield increasing to 1,500 pounds. The staple is not, however, as good as on fresh land, being stained by lateness of the seasons. Burr-weeds are most troublesome on these bottom lands.

Shipments are made, as fast as cotton is ginned, to Savannah, by rail, at 40 cents per 100 pounds.

JONES.

Population: 11,613.—White, 3,753; colored, 7,860.

Area: 470 square miles.—Woodland, all; sand hills, 55 square miles; metamorphic, 415 square miles.

Tilled lands: 70,928 acres.—Area planted in cotton, 29,820 acres; in corn, 22,464 acres; in wheat, 2,685 acres; in oats, 3,010 acres; in rye, 147 acres.

Cotton production: 8,297 bales; average cotton product per acre, 0.28 bale, 396 pounds seed-cotton, or 132 pounds cotton lint.

Jones county in its agricultural features belongs in part to the metamorphic and in part to the pine and sand-hills region, the railroad from Macon to Milledgeville, in its route through this county, nearly marking the line of separation between the two regions. In some of the excavations along its line the white kaolin and variegated clays, as well as fossil-shell beds (at Smith's summit) of the central cotton belt, are exposed, while at a very short distance north of the railroad, and sometimes penetrated by it, are the granites and gneisses, either as solid rock or in a state of disintegration. This metamorphic division is hilly, 2 per cent. being said to be too broken for successful tillage. Pink feldspathic granite forms a belt in the lower part of this metamorphic area.

The lands south of Clinton are very generally red and clayey from hornblendic gneisses. Northward the gray sandy soils, with their clay subsoils, prevail, covering a belt several miles in width. Small areas of red lands are interspersed throughout the section, and a wide belt is found crossing the northwestern corner of the county.

The southeastern portion of Jones, covered by the pine hills and gray sandy lands, is underlaid largely by the white and variegated clays.

Smith's summit, a high point on the railroad, shows the following section in the railroad cut: 12 feet, red sandy clay under the soil; 8 inches, joint clay; 3 feet, joint clay, with fossil-shell casts; 6 feet, joint clay containing shells and a stratum of calcareous nodules filled with a yellow rotten clay. "Quicksand" is found below this at 6 feet depth.

The hills are capped with red clay, and a few miles southeastward is found the siliceous shell-rock similar to that near Macon.

As is usual in the metamorphic region, the bottom lands along the streams are narrow, though very rich. The uplands are chiefly devoted to cotton culture. One per cent. of the county is said to be irreclaimable swamp, and 2 per cent. is too hilly for tillage. The lands under cultivation in this county embrace 23.6 per cent. of its area, and are devoted to cotton, corn, small grain, potatoes, etc. Cotton is the chief crop, and has an acreage of 63.4 acres per square mile, or 42 per cent. of the tilled lands.

Macon is the market for the county, cotton being hauled in wagons.

BIBB.

Population: 27,147.—White, 11,429; colored, 15,718.

Area: 240 square miles.—Woodland, all; sand hills, 119 square miles; metamorphic, 121 square miles.

Tilled lands: 52,179 acres.—Area planted in cotton, 20,724 acres; in corn, 14,325 acres; in wheat, 748 acres; in oats, 4,101 acres; in rye, 44 acres.

Cotton production: 5,858 bales; average cotton product per acre, 0.28 bale, 405 pounds seed-cotton, or 135 pounds cotton lint.

Bibb county is divided into two unequal parts by the Ocmulgee river. The county is also situated on the line between the metamorphic and pine-hills belts, the largest area being in the latter.

The city of Macon marks the northern limit of navigation on the river, and also the southern limit of the metamorphic or mineral region in the county. Shoals are formed in the bed of the stream here by the outcropping rocks of the last-named region, while immediately north of the city the same rocks outcrop on the uplands.

East Macon, or that part on the east side of the river, is situated on the clays of the pine-hills belt, which are also found northeastward toward Milledgeville. The siliceous shell-rock or buhr-stone of the lower country is found in this section at Artape's quarry, and white coral limestone is found at Brown's mount and at other points.

On the southwest the metamorphic line extends toward Knoxville, in Crawford county; and southward from this line, and covering the largest part of the county, are the pine hills.

The metamorphic section of the county is hilly and broken, with gray gneiss outcrops for a few miles northwest of Macon; hornblendic rock and a little trap are then associated with it. The soils of this northwestern section are red, mixed with gray sands in patches and small areas. The red often caps the hills and covers the highlands, while the valleys are of a mulatto color—a mixture of the gray sandy and red soils.

The southern part of the county is hilly, and is covered with deposits of drift sands and clays with rounded pebbles, a growth of large pine, and an undergrowth of black-jack and some water oak.

Seven miles south of Macon are red hills, 75 feet above the valleys, showing 25 feet of white clays under the 50 feet of red clay. The bed of white marl lying between the white and red clays in Crawford county does not appear here.

The red-clay hills extend northeast through the county, and underlying the clays are frequently found beds of silicified fossil shells (Tertiary). It is thought that about 75 per cent. of the original timber growth has been removed, and that 10 per cent. is of irreclaimable swamp. Thirty-four per cent. of the county area is under cultivation in cotton, corn, oats, wheat, pease, and sweet potatoes. Cotton is the chief crop, with an average of 86.4 acres per square mile, or 39.7 per cent. of tilled lands. Its average product per acre is low.

W. D. H. Johnson, of Holston, reports an experiment on a sandy loam soil that had been in cultivation for 40 years:

Soil, 12 inches deep with a red-clay subsoil; land well supplied with humus. Original growth, oak and hickory. The results reported are: Yield, without fertilizers, 527 pounds per acre; with 200 pounds commercial fertilizers, about 760 pounds of seed-cotton.

Macon, the railroad center of this part of the state, is the market for many of the adjoining counties. It contains two cotton factories which consume a part of the cotton marketed there.

ABSTRACT FROM THE REPORT OF W. D. H. JOHNSON,(a) OF BOLINGBROKE.

The lands of the county may be classed as dark mulatto, gray sandy, and red clay.

The *mulatto and red lands* have a growth of oak and hickory. The soil is from 1 inch to 10 inches deep, and has a stiff red-clay subsoil. The lands are early, warm, ill drained, and easy to till, producing good crops of corn, cotton, oats, wheat, pease, and potatoes, but are best adapted to cotton, which grows to a height of 3 feet, running to weed in excessive wet weather in August. The plant yields on fresh land 1,000 pounds of seed-cotton per acre, but only 700 pounds after 5 years' cultivation. Crab-grass alone is troublesome. Two-thirds of this land now lies out. When taken in again it is as good as new for the first three or four years. The uplands are much injured by the washing of the soils, but the valleys are benefited 50 per cent. Hillside ditching is resorted to in order to check the damage.

The *gray sandy lands* have also a growth of oak and hickory. The soil has a depth of 12 inches over a yellow gravelly subsoil. It is late and warm, easy to cultivate, and is best adapted to cotton, which grows to a height of 2 or 3 feet, and produces 1,200 pounds of seed-cotton when fresh and 800 pounds after 5 years' cultivation. One-third of these lands now lies out, and does not produce well when again taken into cultivation. The lands wash readily, doing serious damage, and ruining the valleys by the heavy deposit of sand. Hillside ditching and horizontalizing are not effectual in checking the damage.

Cotton is shipped, as fast as ginned, by wagon to Macon.

JASPER.

Population: 11,851.—White, 4,258; colored, 7,593.

Area: 380 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 87,203 acres.—Area planted in cotton, 27,606 acres; in corn, 23,303 acres; in wheat, 4,649 acres; in oats, 2,687 acres; in rye, 33 acres.

Cotton production: 6,741 bales; average cotton product per acre, 0.24 bale, 348 pounds seed-cotton, or 116 pounds cotton lint.

Jasper county differs but little from the counties around it. The country is undulating on the north and rolling or hilly on the south, a dividing ridge between the Ocmulgee and Oconee tributaries lying near the central north and southern portion of the county.

The lands of that part of the county north of Monticello are mostly dark gray and sandy, with yellowish clay subsoils, and are formed from mica-schists and gneisses, the former having quartz seams somewhat gold-bearing. Mulatto and red lands are interspersed throughout the section. These uplands are generally well drained into the Ocmulgee river on the west and the Oconee on the east. The lands on the south of Monticello are for the most part a red clay, the soil being more or less sandy. They extend to the county-line on the south, and are formed chiefly from hornblendic rocks.

Lands under tillage embrace 39.5 per cent. of the county area, and 3½ per cent. are said to be too broken and 1⅔ per cent. too swampy for cultivation. Cotton is the chief crop (31.7 per cent. of tilled land), with an acreage averaging 72.6 acres per square mile. The average product per acre is extremely low.

a Secretary of the Ocmulgee Farmers' Club.

ABSTRACTS FROM THE REPORTS OF WILLIS NEWTON, OF SHADY DALE, AND WILLIAM D. MADDOX, OF MONTICELLO.

The lands may be classed as bottoms, gray sandy glades, and red and mulatto. On bottom lands the cotton is late in growing, inclines to run to weed, is liable to rot and to overflow, and is late in maturing. The gray or mulatto uplands are preferred, as on them cotton matures quickly, is more prolific, and retains its fruit, and it is not subject to as many disasters as on bottom or red lands.

The *gray lands* are of two classes, viz, a dark gray sandy loam (principal growth post oak) with a stiff clay subsoil, and a light gray soil with a clay subsoil, not so productive. The first of these is the chief cotton land of the county, two-thirds of the crops being cotton. The soil is only 2½ or 3 inches deep, and is early and cold, but easy to till. The yield on fresh land is about 1,000 pounds of seed-cotton per acre, or 800 pounds after ten years' cultivation, 1,485 pounds from either making 475 pounds of lint. Crab-grass is most troublesome. The growth is post, red, Spanish, and white oaks, hickory, poplar, pine, dogwood, haw, and gum. One-third of the land lies out, but when again reclaimed it is nearly as productive as at first, and even more productive if fertilized. Horizontalizing is practiced with great success in preventing the washing of the hillsides, from which these gray uplands and valleys suffer.

The *mulatto or chocolate lands* are the next in importance as cotton lands, and are also well adapted to grain. They are found in sections containing from 1,000 to 5,000 acres each, and have a native growth of oak, hickory, poplar, and pine. The soil, a clay loam, is 3½ inches deep, has a stiff gravelly subsoil, and is difficult to till in wet weather. In all other respects, including productiveness, it resembles the gray lands.

The *glade lands*, also covering but a small area, have a growth of black-jack, post oak, and haw bushes. The soil is a coarse gravelly clay loam, 2 inches deep, with a yellow clay subsoil, and is best adapted to corn, though one-half is planted in cotton, and its yield is 1,200 pounds on fresh lands and 500 after ten years (unmanured). One-half of the land lies out; it washes readily, doing serious damage, but no efforts are made to check it.

The *red and stiff lands*, with a growth chiefly of oak, hickory, chestnut, poplar, and pine, have a depth of 4 inches and a red or yellow subsoil. The soil is early and well-drained, difficult to till in wet and easy in dry seasons, and is best adapted to grain. Of the crops planted on this land one-half is cotton. It grows to a height of 3 feet, and yields on fresh land about 800 or 1,000 pounds of seed-cotton per acre, 1,545 pounds being required to make 475 pounds of lint. Ten years' cultivation reduces the yield to 500 or 700 pounds, and the staple is not so good. Crab-grass also gives much trouble. About one-third of this land now lies out; it does not recuperate as rapidly as the gray, and when fertilizers are used it yields from 600 to 800 pounds of seed-cotton per acre. These uplands wash readily, doing serious damage and injuring the valleys 25 per cent. Hillside ditching and horizontalizing meet with only partial success in checking the damage.

Shipments of cotton are made to Madison or Eatonton by wagon, and thence by railroad to Savannah or to Augusta.

BUTTS.

Population: 8,311.—White, 4,277; colored, 4,034.

Area: 180 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 49,090 acres.—Area planted in cotton, 20,755 acres; in corn, 15,880 acres; in wheat, 4,135 acres; in oats, 2,254 acres; in rye, 37 acres.

Cotton production: 6,829 bales; average cotton product per acre, 0.33 bale, 468 pounds seed-cotton, or 156 pounds cotton lint.

The surface of Butts county is generally rolling, with much level area. Granitic lands are found on the northwest, and a ridge of red land from biotite granite extends from Flat shoals, on the Towaliga river, to Key's ferry, just below the junction of the South river with the Ocmulgee. Another ridge, formed from masses of quartz-rock, passes from High falls northeastward to and beyond Indian springs, a noted place of summer resort. With the exception of the narrow red belt mentioned the lands are almost entirely gray and sandy.

In the granitic section the rocks are usually found in fragments, though large areas are sometimes found covered with masses of granite in which the feldspar is found in coarse crystals. The ridges are often very sandy.

One per cent. of the area of the county is said to be too broken and 2 per cent. too swampy for successful tillage. Forty-five per cent. of the original timber growth is thought to have been removed. The county is drained eastward into the Ocmulgee river, the eastern boundary.

Lands under tillage embrace 42.6 per cent. of the area, and are devoted to cotton, corn, small grain, potatoes, etc.; 42.3 per cent. of these lands are in cotton, which averages 115.3 acres per square mile, the county ranking as ninth in the state in this regard.

Cotton is hauled to Griffin or other railroad stations, and thence sent to market or sold off of the wagons to local buyers.

MONROE.

Population: 18,808.—White, 6,693; colored, 12,115.

Area: 470 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 106,673 acres.—Area planted in cotton, 44,979 acres; in corn, 29,884 acres; in wheat, 6,742 acres; in oats, 6,765 acres; in rye, 246 acres.

Cotton production: 13,354 bales; average cotton product per acre, 0.30 bale, 423 pounds seed-cotton, or 141 pounds cotton lint.

The surface of Monroe county is rolling, but not too much so for successful tillage. It gradually falls in elevation to the east and southeast, having an altitude of 875 feet on the railroad on the west, 735 feet at Forsyth, and 625 feet at Prattsville. Its drainage is to the Ocmulgee river, the eastern boundary. A broad belt, in which prevail red clay lands, from hornblendic rocks and gneisses having black mica, passes diagonally through the central portion of the county, while on either side the lands are chiefly gray and sandy. The county on the northwest is generally granitic in character, with predominating gray lands, though there are large areas of red soils, from the decomposition of the black mica, which enters largely into the composition of the rock. Quartz fragments are also abundant on the surface. On the southeast hornblendic gneiss, associated with the gray gneisses, occurs abundantly, and the red and gray lands are very much intermixed. (See analysis of soil, page 35.)

The lands of the water-courses have a rich, dark, chocolate-colored soil, and are well timbered. Tilled lands embrace 35.5 per cent. of the county area, and of these 42.2 per cent. are devoted to cotton, the chief crop. Cotton thus has an average of 95.7 acres per square mile, though in actual acreage for the entire county (44,97 9) the county ranks as seventh in the state. On the other hand, in product per acre it is extremely low (423 pounds of seed-cotton), there being 85 counties whose average each is greater.

ABSTRACT FROM THE REPORT OF R. C. M'GOUGH, OF FORSYTH.

There are in this county many varieties of upland soil, from deep stiff red to light sandy loam. The lowlands (unless largely intermixed with sand) are not well adapted to cotton, which grows luxuriantly but matures very slowly. The area covered by these lands is very limited, and is usually devoted to corn or oats. The uplands seldom fail in producing good crops.

The *light sandy lands* cover one-half the county area; soil, 6 inches deep. The subsoil is a very tenacious and impervious red clay, sometimes yellow, containing hard, white gravel and rounded pebbles of hardened clay or sandstone, and underlaid by gravel and quartz at from 1 foot to 15 feet. The lands are easily tilled in wet and dry weather when well prepared and manured. They are late and cold unless well drained, producing crops of cotton, corn, wheat, oats, rye, sweet potatoes, and pease, but are best adapted to cotton, oats, and potatoes. Cotton, comprising two-fifths of the crops planted, grows 3 or 4 feet high when manured, and runs to weed from excessive rains unless prevented by the use of superphosphates and nitrogenous manures. The yield of these lands when fresh is from 600 to 1,000 pounds of seed-cotton per acre, and the same after ten years' cultivation if any care has been bestowed on them. The staple is the same on both old and fresh land, the buyers making no difference in prices. Hog-, carrot-, or rag-weeds, and especially crab-grass, are the greatest source of trouble. About one-tenth of these lands now lies out; when again cultivated it produces better than the original soil. The lands do not wash readily, except in some sections, where serious damage is done to hillsides, and the valleys are improved. By deep plowing, heavy manuring, and building stone dams across the hollows, the damage is successfully checked. The growth of these gray lands is oak, hickory, short-leaf pine, chestnut, poplar, beech, sweet gum, etc.

The *red lands*, comprising something less than one-half the area of the county, have a growth of the various kinds of oaks, hickory, buckeye, chestnut, walnut, etc. The soil is a yellow or red clay loam, with sometimes coarse, red sand (alternating with gray), from a few inches to several feet deep; the subsoil is much the same, but underlaid at a depth of 10 or 12 feet by a thick bed of loose, gray earth, with no adhesive properties, called "well dirt", porous and leachy, with many perennial springs. The soil contains large and small pebbles, from the disintegration of the granite, which is sometimes found at a depth of from 5 to 30 feet. The land is difficult to till, in wet weather being sticky and in dry seasons very hard and compact. It is, however, early, warm, and well drained, and best adapted to corn and wheat. One-third is planted in cotton, which grows to a height of from 1 foot to 2 feet without manure, the higher the better, and runs to weed in long, continuous wet seasons. Early planting with nitrogenous manures and rapid work facilitate bolling. Crab-grass and poverty-weed, or stone-clover, are the troublesome weeds. Three-fourths of the red lands now lie out. They wash so readily and so much damage is done that they are seldom reclaimed. The yield in seed-cotton is 1,000 pounds on fresh lands, and from 100 to 400 pounds after twenty-five years' cultivation. About 1,500 pounds are required to make 475 pounds of lint, and no difference is made in the staple.

There is a *light sandy loam*, 10 inches in depth, with a heavier subsoil, that accompanies the gray lands, but occupies very narrow limits. It has more poplar, "big-bud" hickory, and ash than is found on other soils. Cotton does well on this land, retaining its fruit better, and yielding from 800 to 1,000 pounds of seed-cotton per acre. Crab-grass is troublesome. None or very little of the land lies out, and is not much injured by washing.

Cotton is sold in Forsyth as fast as ginned, and from there shipped by the Central railroad to Savannah and to Atlanta.

PIKE.

Population: 15,849.—White, 7,780; colored, 8,069.*

Area: 290 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 93,620 acres.—Area planted in cotton, 38,755 acres; in corn, 29,243 acres; in rice, 7 acres; in oats, 5,596 acres; in wheat, 7,510 acres; in rye, 136 acres.

Cotton production: 12,431 bales; average cotton product per acre, 0.32 bale, 456 pounds seed-cotton, or 152 pounds cotton lint.

The surface of Pike county is rolling and broken in places, though there is very little that does not afford excellent lands for cultivation. It is well watered by the tributaries of Flint river, its western boundary, and by Big Potato creek, which flows southward through the county.

The greater part has been cleared, and now more than one-half of the entire area is in cultivation. The average of lands under tillage is 322.8 acres per square mile, an average greater than in any other county of the state.

The lands are the usual metamorphic varieties, dependent upon the character of the rocks, and differing from each other within small areas. They embrace soils more or less clayey and red to great depths and gray sandy or gravelly soils, the subsoil of which is a yellow or reddish clay at a depth of from 6 to 10 inches from the surface. A large region of red and excellent farming lands, derived mostly from hornblendic rocks, occurs on the west, between Big Potato creek and Flint river, reaching from the northern part of the county south through Upson county. It is largely under cultivation, and is thought to be best adapted to grain, though a large percentage is devoted to the culture of cotton, the yield in good seasons being from 600 to 800 pounds of seed-cotton per acre.

The lands of the rest of the county are mostly gray sandy and gravelly, sometimes very rocky, with reddish clay subsoils, timbered with oak and hickory. They are best suited to cotton, and yield an average of a third of a bale, or 500 pounds of seed-cotton, per acre; but in good seasons the yield is often as much as 800 pounds. These lands are derived from granite and gneisses, the former being the prevailing rock on the northwest, where it appears in numerous outcrops, giving to the country a broken and somewhat hilly character, and on the northeast, where it graduates into the gneisses of the rest of the county, the surface is more level. Black or biotite mica enters largely into the composition of these rocks.

The chief crops of the county are cotton, corn, wheat, and oats. Cotton has the largest acreage, and comprises 41.4 per cent. of the lands in cultivation, and averages 133.6 acres per square mile. This average is exceeded in the entire list of counties only by Troup, which has 153.9 acres per square mile. Its corn acreage is 100 acres, and its wheat about 26 acres per square mile.

376

UPSON.

Population: 12,400.—White, 6,133; colored, 6,267.
Area: 310 square miles.—Woodland, all; metamorphic, all.
Tilled lands: 72,475 acres.—Area planted in cotton, 30,551 acres; in corn, 23,143 acres; in wheat, 6,751 acres; in oats, 3,205 acres; in rye, 23 acres.
Cotton production: 8,540 bales; average cotton product per acre, 0.28 bale, 399 pounds seed-cotton, or 133 pounds cotton lint.

The surface of Upson county is hilly or rolling and in places rather undulating, the drainage of the greater part being to the Flint river, on the western boundary. The Flint and Ocmulgee divide passes through the northeastern part of the county. There are low ranges of mountains on the northwest, which are a continuation of the Pine and Oak mountains of Meriwether and Talbot counties, but here turn northward, their sandstones forming gray sandy lands. Through Thomaston and northeastward along the line of the railroad the level uplands are formed by granites. The lands are mostly gray on this upland, while between it and the mountains red lands are most prominent.

On the south from Thomaston there is a large area of sandy pine lands, but over the rest of the county, east and southeast, the red soils form the largest proportion of the lands, interspersed with gray sandy areas. It is said that 2 per cent. of the county area is too hilly for tillage.

Tilled lands comprise 36.5 per cent. of the surface of the county, and of these 42.2 per cent. are in cotton, the chief crop, averaging 98.6 acres per square mile.

ABSTRACTS FROM REPORTS FROM THOMAS J. MIDDLEBROOKS, OF BARNSVILLE, AND E. W. ROSE, OF "THE ROCK" POST-OFFICE.

The gray sandy and red lands of the county are devoted chiefly to cotton, the red soils having been worn greatly by previous cultivation and thus fitted for its successful production. The crops of the county are cotton, wheat, and corn. Both uplands and bottoms may be planted in cotton with but little danger of loss by frosts. It is, however, best to use some fertilizer on bottom lands for surety.

The *gray lands* have a growth of pine, hickory, black-jack, post, and white oaks. The soil varies from a fine to coarse sandy and gravelly, from 4 to 10 inches in depth, with a yellow subsoil, changing to a fine and heavy red clay below. The soil is late, cold, well drained, and easily tilled, and is best adapted to cotton, though when fresh it is good corn land. Of all the lands in cultivation one-half is devoted to cotton. This grows to a height of from 2 to 3 feet, and runs to weed on fresh pine-woods land, which is checked by deep culture and the use of ammoniacal manures. Its yield is from 600 to 800 pounds of seed-cotton per acre on fresh land, and from 400 to 500 pounds after five years' cultivation of good land. The staple is larger and better from fresh land, 1,485 pounds from fresh and 1,722 pounds from old lands making 475 pounds of lint. Rag-weeds are the most troublesome. Not more than 10 per cent. of these gray lands now lie out. They produce well when taken in again and cultivated with fertilizers. These uplands do not wash readily, and but little damage is done either to them or to the valleys.

The *red lands* have a growth of oak, hickory, chestnut, poplar, etc., a depth of from 8 to 10 inches, and a fine stiff clay subsoil, somewhat impervious to water. The soil is early, warm, well drained, and best adapted to corn and wheat unless long under cultivation, when cotton does well. One-third is planted in cotton; it grows to a height of 2½ feet, and runs to weed only on fresh land. It yields from 600 to 800 pounds of seed-cotton per acre on fresh lands, and 400 pounds after ten years' cultivation, the staple then being inferior. Rag- and hog-weeds are most troublesome. About 10 per cent. of the red land now lies out, and after a few years' rest produces moderately well if gullying is prevented. The lands do not wash very readily, and no serious damage is done unless neglected and allowed to gully in course of time. The valleys and bottoms are ruined sometimes by the washing from the uplands. We have an abundance of material on hand to fill up all the gullies, and it pays to use it.

Cotton is either sold at Thomaston, or shipped thence to Savannah.

CRAWFORD.

Population: 8,656.—White, 3,940; colored, 4,716.
Area: 340 square miles.—Woodland, all; sand hills, 161 square miles; metamorphic, 179 square miles.
Tilled lands: 53,531 acres.—Area planted in cotton, 24,754 acres; in corn, 16,737 acres; in wheat, 2,040 acres; in oats, 2,688 acres; in rye, 46 acres.
Cotton production: 6,765 bales; average cotton product per acre, 0.27 bale, 390 pounds seed-cotton, or 130 pounds cotton lint.

Through Crawford county passes the southern limit of the metamorphic region of the state, Knoxville, the county town, being on this line. In a branch in the southern edge of the town is an outcrop of gray gneiss. From that point to the Houston county-line the country is covered with the sands and clays of the pine hills.

The entire surface is hilly and rolling, the Atlantic and Gulf water-divide passing in a southerly course through its center. Flint river forms a part of the western boundary.

The lands of the metamorphic area of the county are gray and gravelly, interspersed with red clay belts and tracts, and underlaid by clay subsoils. A belt of cold, gray clay lands, from clay-slates, occurs along the border of the region, forming high banks on the east side of Flint river.

The red clay hills of the central cotton belt are represented in the county by a small area at Rich Hill, a few miles southeast of Knoxville. This hill has an elevation of 100 or more feet above the level of the country, its summit being of red sandy clay, 50 feet in thickness. Under this are 6 or 8 feet of joint clay, 35 feet of white coral limestone, and finally a white joint clay, 50 feet of which is exposed in a deep gully.

The rest of the county on the south of Knoxville is covered by the sands of the pine hills, white and deep on the hill-tops, with gray soils in the lowlands, in which the underlying white clays outcrop occasionally. Nearly one-fourth (24.6 per cent.) of the county is under cultivation, and 40 per cent. is said to have been cleared of its original timber growth. Cotton, corn, wheat, and oats are the crops of the county. Cotton, the chief crop, has an average of 72.8 acres per square mile, or 46.2 per cent. of the tilled lands. Its product per acre is very low.

ABSTRACT FROM THE REPORT OF R. LE SNEUR, OF KNOXVILLE.

The following soils are distinguished in the county, viz: First and second bottoms on the river and other streams; (2) red and yellow lands; (3) sandy soils of the pine hills. The *sandy pine hills soil* is the chief one. It is best adapted to oats as a general thing, though three-fifths of the crops are of cotton. Two-fifths of the county is of this sandy land, which has a growth of short- and long-leaf pine, red, white, water, and post oaks, hickory, ash, elm, poplar, etc. The depth to the white and variegated colored clays is from 3 inches to 3 feet, giving lands well and ill drained but easy to cultivate. Cotton grows to a height of from 1 foot to 6 feet, yielding at 4 feet 500 pounds and upward of seed-cotton per acre on fresh lands, with low middling lint. Cultivation of ten years reduces this yield to 300 pounds, and in some localities even more is produced without manure. Light crops have resulted usually from exhausted and poor lands and indifferent cultivation.

Both valleys and uplands are injured by the washing away and gullying of the latter, and but slight efforts have been made to check the damage, which amounts to 10 or 15 per cent.

One-third of the lands now lies out. The crops are much troubled with crab-grass, morning-glory, hog-weed, rag-weed, etc.

Cotton is shipped by wagon to Macon at 50 cents per 100 pounds.

TAYLOR.

(See "Central cotton belt".)

TALBOT.

Population: 14,115.—White, 4,448; colored, 9,667.

Area: 360 square miles.—Woodland, all; sand hills, 74 square miles; metamorphic, 286 square miles.

Tilled lands: 74,037 acres.—Area planted in cotton, 36,310 acres; in corn, 25,696 acres; in wheat, 3,882 acres; in oats, 3,652 acres; in rye, 82 acres.

Cotton production: 10,325 bales; average cotton product per acre, 0.28 bale, 405 pounds seed-cotton, or 135 pounds cotton lint.

Talbot county has for its most prominent features a mountainous region on the north, a rolling and broken county with gray and red lands southward beyond Talbotton, the pine-hills region on the south, and through the county from the north to the pine hills the broad trap dike, extending in a direct line between the chalybeate springs of Meriwether to Talbotton and southward to a point not far from Geneva.

Pine mountain, on the north, along which the county-line runs, is about 325 feet above the valley; Oak mountain, lying parallel, is 135 feet high. Both are of sandstone, which dips in opposite directions (anticlinal), and have narrow summits. Between them is the broad valley already mentioned in Harris county. It is here broader, and with perhaps more red lands than in Harris. The rocks forming the soils are hornblendic granites (syenites) with quartz ridges or "burst-ups" and gneisses.

South of Oak mountain there are hills of varying heights, which give to the county a rough or broken character. On the east the lands are chiefly red clays, from decomposed hornblendic rocks and granites, and have a width of about 3 miles, and lie parallel with Oak mountain; but on the west and south gray sandy or mulatto lands predominate. These lands have the usual red and yellow clay subsoils. Granite accompanies the trap dike throughout in this section south of the mountains. The mass of trap-rocks is so dense as to leave no tillable land within the belt, and the rocks are used largely for building fences. They disintegrate very slowly.

The sands and variegated clays of the pine hills, besides covering all the lower part of the county, form low ridges between the streams northward for some miles.

On the hill at Geneva, and also in a greater mass on the southeast in the bed of a creek, is found a cemented mass of gravel, white clay, and mica, or what seems to be a granite *débris*.

Six per cent. of the county area is said to be too broken and 2¾ per cent. too swampy for successful tillage. Lands under tillage embrace 32.1 per cent. of the county area, though 70 per cent. of the original timber growth is said to have been removed. Cotton is the chief crop (49 per cent. of tilled lands), having an average of 100.9 acres per square mile, the county ranking as seventeenth in the state in this regard.

ABSTRACTS FROM THE REPORTS OF W. M. GORMAN, OF GENEVA, AND WILLIAM H. ELLISON, OF SHILOH, HARRIS COUNTY.

The lands of Talbot county may be classed as gray post-oak uplands, red lands (including mulatto), and light sandy bottom.

The *gray lands* have a gravelly soil 6 inches deep, a bright-red clay subsoil, crumbling when exposed to the air for a length of time, and a growth of post oak, hickory, and poplar. Cotton comprises half the crops, grows to a height of from 3 to 5 feet, and yields from 800 to 1,000 pounds of seed-cotton per acre on fresh land. Ten years' cultivation (unmanured) reduces this to 300 or 500 pounds, 1,545 pounds from old land making 475 pounds of lint, rating as good middling for the first, but inferior for the last. Crops are troubled with rag- and hog-weeds. More than one-half of these lands originally under cultivation now lies out. After a long rest they produce very well for four or five years. The uplands and valleys are both much injured by the washing of the upland soils unless well ditched, and even this is only partially successful in checking the damage.

The *red lands* occur in patches sometimes a mile or two in extent, and have a growth of hickory, poplar, red, and white oak. The soil is a red gravelly clay loam, 12 inches deep, with a sticky subsoil, which becomes hard when exposed. It is early when well drained and easy to cultivate in dry weather, and is best adapted to grain, though cotton is largely planted on it. The latter crop grows to a height of from 3 to 7 feet, and runs to weed when the land is new or the seasons are wet. Fertilizing and proper cultivation prevent this. It yields 600 or 800 pounds of seed-cotton per acre on fresh land and 300 or 400 pounds after ten years' cultivation. One-third of the land now lies out. The uplands and valleys are both injured very materially by the washing of the upland soil, but very little effort is made to check the damage.

The *creek bottoms* are usually very narrow and not much in cultivation. The growth is poplar, ash, white oak, willow, etc. The soil is a dark sandy loam, 2 feet in depth, and has a tough yellow clay subsoil. It is best adapted to corn and cotton, and is generally devoted to the former. There is not sufficient underdrainage for cotton, and therefore frequent rains, especially in July and August, cause it to shed and the bolls to rot. It is also more liable to the boll-worm and to be injured greatly by early frosts. It is only with a dry, late fall that the lowlands can be relied on. Cotton grows to the height of 8 feet on fresh land, and yields from 1,000 to 1,500 pounds of seed-cotton per acre, and the same after ten years' cultivation. The lint rates as good middling.

The *mulatto lands*, comprising a large part of the lands of the county, have a growth of various oaks, hickory, chestnut, poplar, pine, gum, and walnut. The soil, a fine sandy clay loam of various colors, has a depth of 12 inches, and a light to deep stiff red-clay subsoil. It is best adapted to grain, though one-half of the crops is of cotton. It yields 600 pounds of this latter crop per acre when fresh and 400 pounds after eight years' cultivation.

Shipments of cotton are made to Macon and to Columbus by railroad.

MERIWETHER.

Population: 17,651.—White, 7,797; colored, 9,854.

Area: 490 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 124,118 acres.—Area planted in cotton, 49,676 acres; in corn 35,842 acres; in wheat, 8,026 acres; in oats, 7,340 acres; in rye, 209 acres.

Cotton production: 15,154 bales; average cotton product per acre, 0.31 bale, 435 pounds seed-cotton, or 145 pounds cotton lint.

Meriwether county on the southeast is especially rough and hilly, a large section along the river from Pine mountain northward, via Red Bone, nearly to Woodbury, known as "the cove", being nearly impassable to wagons. Mineral springs occur along the foot of Pine mountain, the Chalybeate, Warm, and White Sulphur (not at the foot) being noted places of resort for the people of Columbus and other cities. Flexible sandstone is found near Warm Springs. The top of the mountain just southward has a very broad and level surface and a sandy soil.

Northward to Greenville the county is rolling and broken, the lands gray and sandy, with red clay soils in some places. There are granite outcrops just east of the White Sulphur springs.

Quartz gravel and rock in large quantities exist on these lands, derived from veins and seams in the mica-schists, which occur abundantly. Northwest of Greenville a granite belt is found passing westward into Troup county at Mountville, and another on the northeast, occupying the section between Line creek and the wagon-road leading from Location, in Coweta county, south to Flat Shoals. The rock forms large bowlders on the surface. Long-leaf pine is a prominent growth on the gray gravelly lands of the section.

On the northwest of the county a broad area or belt of red clay lands enters from Coweta county west of Grantville, and, passing in a southerly course to within 6 or 7 miles of Mountville, turns westward into Troup county. Hornblendic gneiss is the prevailing rock of this belt, and gold has been mined largely just east of it.

While the general surface of the county is rolling and broken, only 6 per cent. is too much so for cultivation, and large areas of level uplands are found in various sections; 78 per cent. of it is said to have been cleared.

Lands under tillage comprise 39.6 per cent of the area, and are devoted to corn, cotton, wheat, oats, rye, barley, potatoes, etc. Cotton is the chief crop (40 per cent. of tilled land), and has an average of 101.4 acres per square mile, ranking fifteenth in the state in this regard and fifth in the total number of acres in cotton.

ABSTRACT FROM THE REPORT OF J. E. G. TERRELL, OF GREENVILLE.

The soil is mostly ridge land or upland, and produces cotton well, and unless the early frosts are unusually severe the fruit all matures. The stalk is generally small, but because of its locality it fruits and matures well. The flat or low lands are in considerable amount and produce cotton well if a good fertilizer is used to make the bolls open well.

The *sandy and light uplands* comprise at least two-thirds of the area of the county, and alternate with small belts of red lands for 10 miles in every direction. The soil is coarse, sandy and gravelly, 14 inches deep, with a clay subsoil and a growth of oak, hickory, and pine. Cotton comprises one-half the crops, and grows 3 feet high. It runs to weed in wet springs and summers unless topped early in July and fertilized with guano, and produces from 600 to 700 pounds of seed-cotton on fresh lands per acre, or 300 to 350 pounds after years of cultivation, with a shorter and more brittle staple, and is most troubled with rag-weeds, "poor Peter," and May-pop vines.

One-fifth of the land now lies out, but produces well for three years when reclaimed with fertilizers. Much damage is done by the washing of the uplands, and the valleys are sometimes ruined. Hillside ditching is in some places a satisfactory means of preventing or checking the damage.

Cotton is hauled to La Grange and to other points on the Atlanta and West Point railroad for sale or shipment.

TROUP.

Population: 20,565.—White, 6,595; colored, 13,970.

Area: 430 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 129,046 acres.—Area planted in cotton, 66,188 acres; in corn, 38,677 acres; in wheat, 7,342 acres; in oats, 6,975 acres; in rye, 87 acres.

Cotton production: 18,655 bales; average cotton product per acre, 0.28 bale, 402 pounds seed-cotton, or 134 pounds cotton lint.

Chattahoochee river cuts off the northwest corner of Troup county, which is rough, broken, and quite hilly. Granites occupy the extreme corner, while southward from it are alternating ridges and belts of quartz, gneisses, and hornblendic rocks, with their respective rocky, gravelly, and sandy gray and red lands, the latter being prominent as far south as the road leading from La Grange to Fredonia, Alabama.

The surface of the country is broken and rolling, a line of narrow quartz ridges having a southwest trend occurring east of West Point and terminating in Alabama. The drainage of the county is entirely to the Chattahoochee river, on the west.

The most prominent feature of that part of the county east of the river is the deep red-clay land, a belt of which, several miles wide, extends from the northeast to and a little beyond La Grange, another small area lying northeast from West Point.

The main red region extends to Yellow Jacket creek, on the north, with narrow areas of gray lands. Gray soils, when found, are usually so thin that in plowing a mulatto variety is produced by the mixture of the underclay with them. These red lands are formed chiefly from hornblendic gneisses and syenites, the latter producing, by decomposition, the more clayey and deeper red soils. (See analysis, page 39.)

Along the southern line of the red belt there are outcrops of magnesian rocks, such as serpentine and soapstone. Near Mountville, on the east, these are accompanied by asbestus and chrome iron ore. Two miles north of West Point corundum and asbestus are found, with another outcrop of soapstone. Other localities of soapstone are on the west side of the river from La Grange, and on the Heard county-line not far from Corinth.

On the north of this belt are gray sandy hills, from the washings of which the wide bottom of Yellow Jacket creek has been covered with deep sand. They extend nearly to the Heard county-line, where red lands again predominate.

In the southeastern part of the county, embracing all lying south of a line from 3 miles north of Mountville to Flat Shoals creek, near West Point, the lands are gray sandy and gravelly, and are formed largely from gray biotite gneisses. Areas of red lands occasionally occur in this section, and in some places the rocks are garnetiferous.

Bordering this section on the northward is a belt of biotite granites, the rocks outcropping frequently in bowlders of very coarse material, accompanied by black tourmaline crystals. The soil is coarse and sandy. At Mountville the country is quite level, but becomes more broken on the southwest, until the belt terminates apparently with the quartz ridges near West Point already mentioned.

Tilled lands embrace 46.9 per cent. of the county area, an average of about 300 acres per square mile. It has, next to Pike and Houston counties, the largest percentage of tilled area in the state. Five per cent. of the area is said to be swampy, 3⅓ per cent. too broken for tillage, and 75 per cent. of the area cleared of its timber. Cotton is the chief crop, its average being 153.9 acres per square mile, or 51.3 per cent. of tilled land. In the former regard it ranks first in the state, in total acreage fourth, and in total bales fourth. Its product per acre is low.

ABSTRACTS FROM THE REPORTS OF DR. WILLIAM P. BEASLEY AND C. W. MABRY, OF LA GRANGE.

The soils may be classed as red clays, gray, or mulatto, and are all planted in cotton.

The *red lands* are the best, and cover about three-quarters of the area of the county, and especially of the uplands. They are interspersed with gray and mulatto soils, and have a growth of oak, pine, hickory, poplar, ash, black gum, buckeye, and chestnut. The soil has a depth of from 2 to 12 inches and a red-clay subsoil. Cotton comprises two-thirds of the crops, which grows from 1 foot, or "bumble bee size", to 5 feet high, and is inclined to run to weed when highly fertilized and when there is a great deal of rain while it is putting on fruit. It may be dwarfed or restrained by plowing close to the plant and cutting the lateral roots. On fresh land the yield is from 700 to 1,000 pounds of seed-cotton per acre; after eight to ten years' cultivation (unmanured), only 500 to 700, and after thirty years 300 to 400 pounds. The lint from old land is not as long as that from fresh land, but the seeds are lighter. The staple is classed as middling. Crab-grass is most troublesome to all crops. Old lands that have been lying out for a few years and have grown up in pines produce well for a few years if slightly fertilized. The hills are subject to washing or gullying, and sometimes the damage done is very serious to both uplands and valleys.

Those farmers who have tried terracing the hillsides prefer that method of checking the damage to all others. Dr. Beasley says: "Cotton production has greatly decreased within the last few years in this immediate section in spite of the reclaiming of old pine fields and the increased introduction and use of the various commercial fertilizers; and I am of the opinion that less and less will be produced here annually until our system of farming is radically changed and the soil has a chance to recuperate from the continued production regardless of rotation of crops."

Shipments are made to Atlanta, Savannah, and to New York.

HARRIS.

Population: 15,758.—White, 6,450; colored, 9,308.

Area: 470 square miles.—Woodland, all; metamorphic, all.

Tilled lands: 91,989 acres.—Area planted in cotton, 43,203 acres; in corn, 26,871 acres; in wheat, 5,549 acres; in oats, 5,438 acres; in rye, 23 acres.

Cotton production: 12,677 bales; average cotton product per acre, 0.29 bale, 417 pounds of seed-cotton, or 139 pounds cotton lint.

The chief topographical feature of Harris county is Pine mountain, a low though prominent range passing through the central part of the county into Alabama. Oak mountain enters on the east, and south of Pine mountain, with which it lies nearly parallel, to Hamilton, its terminal being on the eastern edge of the town.

Pine mountain, the higher of the two, has an elevation of 375 feet above the level of the country. Both have narrow summits, on which sandstone, dipping in opposite (anticlinal) directions, is found outcropping. Between the two mountains there is a fine valley, several miles wide, of red and gray lands, very productive, and mostly under cultivation.

The country northwest of the mountains is rolling, with lands mostly gray and sandy, but eastward they are more level. On the south the surface of the country is very similar, except from Hamilton westward to the river, which is very hilly and broken. For some miles south of the mountain the lands are gravelly and sandy, with a prominent growth of long-leaf pine in some sections.

On the south and southeast of Hamilton the lands are interspersed with red clays and are of a better class. A small outcrop of soapstone occurs at Kingsboro', with some hornblendic gneisses. The growth here is oak, hickory, pine, and a few cucumber trees.

The rocks of the county are chiefly gray gneisses with biotite mica and mica-schists. Loose fragments of quartz are very abundant on the surface in some sections.

Seven per cent. of the county area is said to be too hilly for successful tillage, and 75 per cent. has been cleared of its original growth. The streams have narrow bottoms of a rich, dark, loamy soil, but are not devoted to cotton culture.

Tilled lands comprise 30.6 per cent. of the county area, and of these 47 per cent. is in cotton, the chief crop, its average being 91.9 acres per square mile. The county ranks tenth in the state in total cotton acreage.

ABSTRACT FROM THE REPORT OF JAMES M. MOBLEY, OF HAMILTON.

The lands of the county are very much mixed, gray sandy, red sandy, and red clays occurring often within the same field.

The *sandy soils* are best for cotton, the dark clay lands being best adapted to wheat. The subsoil is generally a fine red or yellow clay. The crops of the county are cotton, corn, wheat, potatoes, rye, and sugar-cane. Cotton grows to a height of 2½ or 3 feet, and is inclined to run to weed in rainy seasons and on red or dark clay lands. A little less plowing and more guano will check this tendency and favor bolling. The yield is 800 pounds of seed-cotton per acre on fresh and 400 pounds on old land, 1,485 pounds on the last making 475 pounds of lint, the staple becoming inferior. The most troublesome weeds are hog- and coffee-weed, bull-nettle, Jamestown weeds, and May-pop vines. The uplands wash readily, doing serious damage unless checked, which is usually accomplished by ditching. One-third of the lands now lies out. When again taken in they produce very well for a few years, and cotton especially does well when the lands are level and without gullies. The climate is mild and healthy and well adapted to cotton culture, early frosts in the fall alone being injurious. The frosts of April and May seldom do much damage. One-third of the lands under cultivation is devoted to cotton.

Shipments are made to Columbus.

MUSCOGEE.

Population: 19,322.—White, 8,995; colored, 10,327.

Area: 210 square miles.—Woodland, all; sand hills, 123 square miles; metamorphic, 87 square miles.

Tilled lands: 44,718 acres, or 33.3 per cent. of county area.—Area planted in cotton, 11,625 acres; in corn, 8,263 acres; in wheat, 310 acres; in oats, 2,071 acres; in rye, 31 acres.

Cotton production: 3,268 bales; average cotton product per acre, 0.28 bale, 402 pounds seed-cotton, or 134 pounds cotton lint.

Muscogee county overlaps the granitic and metamorphic region on the north and the sandy long-leaf pine hills on the south, the Southwestern railroad almost marking the line of separation between them, while along the river is a broad and level valley extending nearly to Upatoi creek.

A small proportion of the area of the county is too hilly for cultivation. The bottom lands are about 25 feet above the river, and are not subject to overflow. Columbus is situated in this level valley, and at the foot of what here is a metamorphic terrace, which for some distance up the river is quite level, its dark, rich sandy loam soil being underlaid at a few feet by a layer of large water-worn pebbles and agates, in some places 4 feet thick, which become smaller eastward, and disappear within a few miles of the river. Underlying these uplands, and forming the high and long falls across the river, are metamorphic rocks, which differ in character from the more common varieties in other parts of the state.

Granites outcrop over most of the metamorphic section of this county, forming generally a broken country, and by disintegration a sandy and gravelly soil, with the usual red lands. The feldspar in the rock is frequently of the pink variety and large. The rocks that form the falls and the immense shoals from Columbus northward are highly siliceous, and contain biotite and some coarse, pink feldspar, which is also found below the falls. This feldspar by its decomposition probably gives to the thick beds of clays below the falls their pinkish and variegated colors. This metamorphic outcrop forms the limit of river navigation from the southward.

The pine hills of the country south of the metamorphic are high and level, having an altitude of about 200 feet above the creeks. They are covered with a growth of long-leaf pine, black-jack, with some oak. The soil is sandy and often deep, and fragments of ferruginous sandstone lie in abundance on their summits. These lands extend northward for some distance between the creeks in the metamorphic section, and yield an average of only from 5 to 7 bushels of corn or 300 pounds of seed-cotton per acre. The clays that underlie these hills are exposed along the river bluff, and near Upatoi creek are overlaid by the peculiar sand, mica, and kaolin conglomerate found in Taylor county near Geneva. Blue clay marls, having but a small proportion of carbonate of lime but some large fossil shells, outcrop in the banks of Upatoi creek for several miles, and for a very short distance north on the river bluff.

The river valley lands are somewhat open, with very small tracts of prairie. In the metamorphic the red lands, while most durable, are best for small grain, the gray sandy soils being preferred for cotton. They yield 12 or 15 bushels of corn and from 7 to 10 of wheat per acre, cotton varying from 500 to 800 pounds on the red to 800 or 1,000 on the gray land.

One-third of the county area is under tillage in cotton, corn, small grain, potatoes, etc. Cotton is the chief crop, though it comprises but 26 per cent. of the tilled lands, its average being 55.4 acres per square mile. The product per acre is low.

There are at Columbus and above on the river many large cotton factories, which consume a great part of the cotton of this part of the state as well as of the adjoining portion of Alabama.

ABSTRACT FROM THE REPORT OF JAMES C. COOK, OF COLUMBUS.

The land of the county comprises three kinds, viz: River and creek bottoms, upland red and gray oak and hickory lands, and long-leaf pine lands. The lowlands are preferred for cotton when the seasons are not wet, but the uplands are chiefly planted, as they are well drained, and on them cotton matures earlier.

The *uplands of the metamorphic section* north of Columbus have mostly a gray sandy soil, though these are interspersed with red clays, and usually have a red-clay subsoil. They cover about one-half of the county, and have a growth of oak, hickory, dogwood

and ash, interspersed with pine. The soil varies from fine to coarse sandy and gravelly, and has a depth of from 2 to 4 inches, and a heavier subsoil, which, when plowed up, becomes like the surface soil, and is best adapted to cotton, oats, and pease. Cotton comprises one-half the crops, grows to a height of 4 feet, and produces from 600 to 1,000 pounds of seed-cotton when fresh and 300 to 600 pounds after years of cultivation. From 1,350 to 1,660 pounds will usually make 475 pounds of lint. This, as well as the sandy hills soil of the southern section, washes readily, and would do serious damage but for hillside ditching. One-fourth of this land now lies out, improving very sensibly by rest.

The *dark sandy loam and clay lands*, comprising about one-fourth of the county, include the bottom and valley lands. The soil is a fine sandy clay loam from 5 to 12 inches in depth, with a heavier subsoil, which becomes like the soil by cultivation. It is early when well drained and generally easy to cultivate. The clayey areas are hard to break when dry. Cotton, comprising one-half the crops, grows to a height of from 4 to 6 feet, and is most productive at this height, yielding from 1,000 to 1,500 pounds of seed-cotton when fresh. A few years' cultivation reduces this 600 or 1,000 pounds. Cockleburs and morning-glory vines are most troublesome. One-tenth of this land now lies out, producing well when again taken in.

The *southern sandy long-leaf pine region*, covering one-fourth of the county, has a gray sandy soil from 12 to 24 inches in depth, a sandy subsoil of a yellow or red color, and a growth of pine and black-jack. Sand or gravel underlies this in places. The soil is early when well drained, otherwise late; easy to cultivate, and best adapted to cotton and potatoes. Cotton comprises two-thirds of the crops, and grows to a height of from 3 to 4 feet, but runs to weed in wet weather unless topped, and yields from 600 to 800 pounds of seed-cotton per acre when the land is fresh. After a few years this yield is only from 200 to 300 pounds. One-fourth of this soil now lies turned out, and it is improved by rest.

A number of large cotton factories are located along the Chattahoochee river.

Shipments of cotton are made to Savannah by railroad.

CENTRAL COTTON BELT.

The central cotton belt includes, in whole or in part, the counties of Columbia,* Richmond, Burke, Screven,* Jefferson, Glascock, McDuffie,* Warren,* Hancock,* Washington, Johnson,* Laurens, Wilkinson, Baldwin,* Bibb,* Twiggs, Pulaski, Houston, Crawford,* Taylor, Talbot,* Marion, Muscogee,* Chattahoochee, Stewart, Webster, Schley, Macon, Dooly,* Sumter, Lee, Terrell, Randolph, Quitman, Clay, Calhoun, Dougherty, Baker,* and Early.

COLUMBIA.

(See "Metamorphic or middle Georgia region".)

RICHMOND.

Population: 34,665.—White, 17,185; colored, 17,480.

Area: 320 square miles.—Woodland, all; oak, hickory, and pine uplands, 30 square miles; sand hills, 290 square miles.

Tilled lands: 36,626 acres.—Area planted in cotton, 7,871 acres; in corn, 11,793 acres; in wheat, 1,549 acres; in oats, 4,209 acres; in rye, 12 acres.

Cotton production: 2,742 bales; average cotton product per acre, 0.35 bale, 495 pounds seed-cotton, or 165 pounds cotton lint.

Richmond county is situated on the line between the metamorphic and pine-hills regions, and its area is divided between these, though by far the largest part is covered by the sands of the latter. The shoals in the Savannah river 3 miles north of Augusta, formed by metamorphic rocks, mark the head of navigation on that river. A canal 150 feet wide, 11 feet deep, and 9 miles in length has been constructed from the city northward, by which small boats bearing cotton and other products are enabled to reach the market from the up counties.

In the beds of the streams north of Augusta the rocks of the metamorphic are exposed, and are covered on the uplands by the sands and other material of the pine hills. Still northward are high and broken hills with red clay soils and a growth of oaks and short-leaf pine. The lands are rocky, and are known as "the Red Hills". South from Augusta the sandy pine lands are more level until the red hills of the central cotton belt are reached. Over the western part of the county, southward from a mile or two north of the railroad, are the pine hills, with their sandy soils and white clay subsoils and growth of long- and short-leaf pine and stunted black-jack oak. Ferruginous sandstone is found on these hills.

From Augusta west to Belair the county rises to 205 feet above the river, or 177 feet above the city. Berzelia, 11 miles westward on the county-line, is 193 feet higher than Belair, and is located on a ridge which on the south forms the divide between the tributaries of the Savannah river and Brier creek.

A small area covered by the red hills of the central cotton region is found in the extreme southern section of the county. They rise 135 feet above McBean's creek, and pass southward into Burke county. The extensive valley lands of the river south from Augusta are largely under cultivation in cotton. But a small percentage (17.9) of the county area is under tillage, and of these lands 21.5 per cent. is in cotton. Corn, however, is the chief crop. Cotton has an average of 24.6 acres per square mile; but 5 per cent. of the county area is said to be irreclaimable swamp. There are in Augusta four large cotton factories, two fertilizer manufactories, one cottonseed-oil mill, besides mills of other kinds. Much of the cotton of the surrounding counties is used here.

ABSTRACT FROM THE REPORT OF A. H. M'LAWS, OF AUGUSTA.

The farming lands may be classed as follows: Overflowed lands of the river, level pine lands, with pipe-clay subsoil, and rolling uplands.

The *river lands*, comprising 20 per cent. of the area of the county, are considered the best for cotton. The soil is a fine, silty loam, 2 to 3 feet deep; the subsoil is a red, micaceous, putty-like clay; and the growth is beech, white and water oaks, hickory, ash, holly, bay, birch, walnut, mulberry, sycamore, and cottonwood. These lands are hard, and break up in clods. Cotton comprises one-half the crops, and grows 5 or 6 feet high, or 3½ to 4 feet in rows 4 or 5 feet apart, running to weed if the latter are too narrow or the land is thin and sandy. These valleys are improved by the washings of the uplands, and very little land now lies out. Cockleburs, butter-weed, and joint-grass (a coarse, bluish-gray grass with two or three seed spikes) are most troublesome. The yield in cotton is an average of 1,500 pounds of seed-cotton per acre on fresh land. After three years' cultivation, without manure, the yield is one-third less, and the staple becomes shorter and less silky.

The *red lands* comprise one-fifth of the area of the county on the north and south. The soil has a depth of 10 inches, with a sand and clay mixture, and contains "Georgia pills", a small "lenticular clay ironstone". Ferruginous sandstone and buhr-stone are found in the southern red belt. These lands are early, warm, well drained, easy to till, and best adapted to cotton, corn, grain and potatoes, and fruit of all kinds. One-fifth is planted in cotton, and the yield is from 500 to 600 pounds of seed-cotton per acre when fresh and from 300 to 500 pounds after five years' cultivation. Crab-grass is most troublesome. The soil washes readily, doing some damage to the uplands, but none to the valleys. Horizontalizing checks it very easily. One-fourth of these lands now lies out, being much improved by rest and the assimilation of vegetable matter.

The *flat gray lands*, with a depth of 6 inches, have a growth of long- and short-leaf pine, oak, bay, gum, and some hickory. They comprise only one-tenth of the lands of the county, over a territory 6 miles long and 3 miles wide south of Augusta. The subsoil is a hard-pan or pipe-clay, impervious to water. This land is best adapted to corn, melons, potatoes, and small grain. Richmond is the great "watermelon-producing county". Cotton is subject to black or humid rust, but, when well manured on the surface, yields well. Even on fresh land, when unmanured, the yield is only one bale of lint (500 pounds) to five acres. One-fifth of the crops is of cotton.

The climate in this county is not subject to the long dry spells of the more southern counties, and the seasons are generally regular.

Cotton is sold in Augusta.

BURKE.

Population: 27,128.—White, 6,089; colored, 21,039.

Area: 1,030 square miles.—Woodland, all; lime-sink (wire-grass) region, 100 square miles; pine barrens (wire-grass), 106 square miles; sand hills, 64 square miles; oak, hickory, and pine uplands, 760 square miles.

Tilled lands: 228,886 acres.—Area planted in cotton, 87,359 acres; in corn, 68,131 acres; in wheat, 406 acres; in oats, 4,457 acres; in rye, 29 acres.

Cotton production: 29,172 bales; average cotton product per acre, 0.33 bale, 477 pounds seed-cotton, or 159 pounds cotton lint.

The surface of Burke county is rolling and broken on the north, but becomes more and more level to the south, gradually falling in elevation. Four agricultural divisions are represented in this county, viz: sandy pine hills on the northwest corner; red lands or hills just south of them; yellow loam in the middle; and the pine and wire-grass on the southwest.

White marls and limestones, exposed at many places, underlie almost the entire county, and are easily accessible, and when used as stimulants on the lands yield valuable results after the first year or two.

Shell bluff, the most noted exposure of these marls, is composed of alternating beds of shell marl and clays. (See page 14.)

Buhr-stone or siliceous shell-rock occurs in abundance, overlying these beds or in fragments on the surface. By their decomposition a fine powder is produced, in which are found the siliceous sponge spicules alluded to in the description of this part of the central cotton belt (page 44) as forming in some of the dry ponds a fine dust pernicious to the lungs. The soil of the dry ponds is very black from decayed vegetation, is about 10 inches deep, and overlies a white pipe-clay. The growth is chiefly pine. The buhr-stone or shell-rock at Stone bluff, on the Savannah river, is 10 feet thick. Lime-sinks and ponds are found in the southwestern part of the county. The oak, hickory, and pine uplands occupy the largest area. Their soils are sandy, several inches deep, and are underlaid by a yellow-clay subsoil. The growth is red, hickory, and black-jack oak, dogwood, and long-leaf pine. Yellow and brown ferruginous pebbles or gravel are abundant everywhere. Along the Savannah river uplands long-leaf pine is most prominent, with an undergrowth of black-jack and black oak. This river belt extends southward through Screven into Effingham county. Short-leaf pine is found north of Waynesboro' to McBean's station, while some wire-grass appears just south of Alexander and in patches over this part of the county.

The surface of the country on the north is high and broken, 135 feet above McBean's creek. The red lands cover the broken country on the west from Waynesboro' and McBean's, but between these two points and eastward to the river the lands are a yellow sandy loam. At the foot of this high land, at Boggy Gut creek, the soft white marls outcrop 6 feet thick, and beds of iron ore are found in these clay lands 4 miles northwest of Waynesboro'.

Altogether, these red lands cover about one-third of the area of the county, not only on the hills of the north, but along the slopes of the uplands near the streams. They have the general character of the entire region (see description, page 39).

The wire-grass region of the southwestern part of the county is of the better class, having clay subsoils, underlaid by the limestones and marls, with numerous lime-sinks on the west, and extending into Jefferson are the "flatwoods", a very level country with yellow loam lands.

Tilled lands comprise 34.7 per cent. of the county area, and of these 38.2 are in cotton, the chief crop, which averages 84.8 acres per square mile. In the total acreage and bales Burke county, because of its large area, ranks as first in the state.

Sixty-two per cent. of the lands of the county are said to have been cleared, and 5 per cent. is too swampy for cultivation, being subject to overflows.

The pine hills of the northwestern corner are covered with sands and variegated clays and a growth of pine and black-jack. The lands are poor, and are soon exhausted unless highly fertilized.

ABSTRACTS FROM THE REPORTS OF W. B. AND J. B. JONES, OF HERNDON.

The lands of the county may be placed in three classes, viz: (1) Gray, light, and sandy soils, with clay subsoils; (2) reddish or brown soils, resembling the clay subsoils on which they rest; (3) a dark gray, sometimes nearly black, found in hummocks and flat bay lands bordering the rivers, creeks, and branches. The subsoil is a sand or white pipe-clay. Cotton cannot be safely grown on these hummocks and flat lands for more than three or four years after they are first brought into cultivation, as they are then liable to rust.

The *gray sandy lands*, with red or yellow subsoils, cover two-thirds or more of the county, and have a growth of oak, hickory, and pine. The soils are from 3 to 9 inches deep, sometimes contain black gravel, and are underlaid by shell-rock at from 1 foot to 5 feet. The crops of the county are cotton, corn, oats, wheat, rye, potatoes, pease, sugar-cane, rice, and varieties of millet. Cotton comprises one-half or more of the crops, grows from 2 to 4 feet high, and runs to weed with too much rain, or when there is a deficiency of potash in the soil. On fresh lands the yield is from 800 to 1,200 pounds of seed-cotton per acre, the lint rating as middling. Cultivation of eight years reduces the yield to 600 pounds, and 1,545 pounds make 475 pounds of lint, which is shorter and inferior in every respect to that of fresh land, and rates as ordinary. Crab- and crowfoot grasses and hog-weeds are most troublesome. About two-fifths of these lands now lie turned out, but when reclaimed they yield about two-thirds of the original crop. They wash readily, and sometimes do serious damage to the slopes; but slight injury is done the valleys, which horizontalizing and hillside ditching are quite successful in checking.

The *red clay lands* of the upper part of the county comprise one-third of the entire area. The soil is usually sandy for 3 inches, but the subsoil is a tough, tenacious, and impervious clay, overlying limestone at from 1 foot to 40 feet. The land is best adapted to cotton, corn, and wheat. Two-thirds of the land under cultivation is devoted to cotton, which grows to a height of from 3 to 5 feet. From 1,000 to 1,400 pounds of seed-cotton are produced on this soil when fresh, but after seven years' cultivation it yields only 800 pounds, 1,544 pounds from old land making 475 pounds of lint. In the latter case the fiber is shorter and lighter in color. Hog-weeds are most troublesome. One-third of this land now lies turned out; when taken into cultivation again, after ten or twelve years' rest, it produces from one-half to three-fourths as well as when fresh. It washes readily and rapidly on slopes, doing serious damage also to the valleys; but little or no effort has been made to check it.

Hummock lands.—These comprise about one-tenth of the lands of the county bordering the streams, the sandy subsoil being underlaid by a tough pipe-clay and sand and gravel at from 5 to 10 feet. These lands are best adapted to corn and oats, and very little cotton is planted on them. For the first year or two cotton does well, growing to a height of from 3 to 5 feet, and yielding about 1,000 pounds of seed-cotton per acre; but after three years this yield is only from 300 to 500 pounds. Over half of these cultivated lands now lies out, and when taken in again only produce half as well as at first. The seasons in this county are not extreme as to drought and rain. The atmosphere is humid, and the nights in the latter part of summer are attended with heavy dews, which favor cotton and all fall crops, compensating in a measure for occasional droughts. The growing season is long, extending from March 15 to October 15.

Cotton is shipped from September to March, by railroad, to Savannah (mostly) at 35 cents per 100 pounds.

SCREVEN.

(See "Lime-sink and wire-grass region".)

JEFFERSON.

Population: 15,671.—White, 5,581; colored, 10,090.

Area: 620 square miles.—Woodland, all; oak, hickory, and pine uplands, 328 square miles; pine barrens (wire-grass), 141 square miles; sand hills, 151 square miles.

Tilled lands: 123,924 acres.—Area planted in cotton, 41,367 acres; in corn, 42,335 acres; in wheat, 5,783 acres; in oats, 6,146 acres; in rye, 307 acres.

Cotton production: 13,377 bales; average cotton product per acre, 0.32 bale, 462 pounds seed-cotton, or 154 pounds cotton lint.

Four divisions of lands, as in Burke, are represented in Jefferson county. Pine and sand hills lie north of Brushy creek, yellow loam with red lands southward across the creek from Louisville, and long-leaf pine and wire-grass over the southern portion of the county.

Ogeechee river flows southeast through the county, Williamson's Swamp and Rocky creeks uniting with it on the south. Brier creek forms a part of the northern boundary. The surface of the country is rolling on the west and north, but on the east there are very level oak, hickory, and pine lands, forming the greater part of the lands of the county.

The pine and sandy hills extend to within 11 miles of Louisville on the north, and resemble the same belt in Glascock county. The underlying limestone and marl outcrop in a number of points, and on the river south of Louisville the exposure in the bluffs is 15 feet thick and extends for several miles, fossiliferous sandstone overlying it in places. Silicious shell-rock is found north of Louisville in abundance, and also at the head of Spring creek, 9 miles southeast, where a quarry was at one time established.

Red lands occur on some of the hills in the county north and east of Louisville, the belt crossing in an easterly course. (See analysis, page 40.) In the northwestern corner, at Fenn's bridge, these clays have a thickness of 15 to 25 feet, and contain fossil shells (*Ostrea*).

The pine and wire-grass lands cover but a small area in the southern part of the county. Their upper limit is found 1 mile south of Williamson's swamp, near Bartow station. The country is very open and level, pine being almost the exclusive timber.

Lands under cultivation comprise 31.2 per cent. of the county area, and are chiefly devoted to corn. Six per cent. of the area is said to be too swampy for tillage. Cotton has an average of 66.7 acres per square mile, and embraces 33.4 per cent. of tilled land.

ABSTRACT FROM THE REPORT OF A. E. TARVER, OF BARTOW.

The *red and gray lands* of the county have a growth of pine, oak, and hickory. The crops are cotton, corn, wheat, rye, oats, pease, potatoes, and sugar-cane, and all do well when well manured and worked. Cotton grows 3 feet high, but runs to weed on fresh land without manure, a good fertilizer being all that is needed to restrain it. From 500 to 1,000 pounds of seed-cotton per acre are obtained from fresh

lands, 1,545 pounds being needed for 475 pounds of lint. After five years' cultivation the yield is reduced to 300 pounds of seed-cotton, 1,575 pounds being necessary for 475 pounds of lint. The staple from fresh land is good and long; that from old is short. No weeds trouble much, but grass is troublesome. About one-tenth of the lands lies turned out, and when again taken into cultivation they yield well for four or five years. They wash readily on slopes, doing serious damage, the valleys also being injured 10 per cent. Some little effort has been made to check this damage by horizontalizing, hillside ditching, and underdraining, and with pretty good success.

Shipments of cotton are made to Savannah at 40 cents per 100 pounds.

GLASCOCK.

Population: 3,577.—White, 2,506; colored, 1,071.

Area: 100 square miles.—Woodland, all; sand hills, nearly all.

Tilled lands: 25,124 acres.—Area planted in cotton, 8,175 acres; in corn, 10,742 acres; in wheat, 4,257 acres; in oats, 1,076 acres; in rye, 54 acres.

Cotton production: 2,635 bales; average cotton product per acre, 0.32 bale, 459 pounds seed-cotton, or 153 pounds cotton lint.

The small county of Glascock is almost entirely within the pine-hills region. The surface of the county is generally hilly, with mostly a poor sandy upland soil.

There is a little red oak and hickory land, with also some river and creek bottoms, which are rich and productive; but some of the latter are irreclaimable, owing to their liability to overflow.

A number of large ponds in the county, having a growth of oak, hickory, and ash, were reclaimed before the late civil war, and now produce well.

Granite is found at Ogeechee shoals and near the county-line north of Gibson, but southward in the river are the clay slates with quartz veins that occur so frequently along the lower limit of the metamorphic. They are, however, here covered on the uplands by sands of the pine hills. Two miles east of Gibson there is quite an area covered with siliceous claystones, highly fossiliferous, but the lands are sandy.

The county is drained almost entirely into the Ogeechee river, the western boundary.

Lands under tillage embrace 39.3 per cent. of the county area, and are chiefly in corn. The acreage of cotton is 32.5 per cent. of the tilled land, and averages 81.8 acres per square mile.

ABSTRACT FROM THE REPORT OF JAMES L. NEAL, OF WARRENTON.

Every kind of soil except the low, wet bottoms is devoted to cotton, but the *stiff clay lands* are considered best. These latter comprise but 10 per cent. of the lands of the county.

The growth of the county is principally long-leaf pine, but is moderately interspersed with oak, hickory, etc. The soil is a sand, 3 inches deep; the subsoil is generally a yellow or variegated-colored sand, the best varieties having a red or yellow clay. The crops are cotton, corn, wheat, and oats. The lands are best adapted to pease, though cotton comprises one-half of the crops. The plant grows to a height of from 1 foot to 3 feet, but the best yield is obtained from a height of from 15 to 20 inches. The height depends on shallow or deep tillage, the former producing fruit and little weed (small growth), the latter but little fruit and tall weed. Running to weed is prevented by early and careful topping, preceded by very shallow culture. The yield is 500 pounds of seed-cotton per acre when fresh, and from 300 to 400 pounds after five years' cultivation, unmanured. Ten years' cultivation still further reduces this product to 100 or 200 pounds per acre. From fresh land 1,845 pounds of seed cotton make 475 pounds of lint; but 1,600 pounds are required from old land, and the staple is inferior. Crab-grass only is troublesome.

About 25 per cent. of the originally cultivated lands now lie out. Five per cent. annually is turned out, but is replaced by freshly cleared land. If allowed to rest twenty or thirty years, and then taken in, the yield for five years is better than when fresh.

Much damage is done by washing, and valleys also are injured to the extent of from 5 to 10 per cent. annually. Some little effort has been made to check it by hillside ditching, with good success if attended to after all the heavy rains.

Shipments of cotton are made to Warrenton and Augusta.

McDUFFIE.

(See "Metamorphic or middle Georgia region".)

WARREN.

(See "Metamorphic or middle Georgia region".)

HANCOCK.

(See "Metamorphic or middle Georgia region".)

WASHINGTON.

Population: 21,964.—White, 9,449; colored, 12,515.

Area: 680 square miles.—Woodland, all; sand hills, 127 square miles; oak, hickory, and pine uplands, 521 square miles; pine barrens (wire-grass), 32 square miles.

Tilled lands: 152,887 acres.—Area planted in cotton, 66,900 acres; in corn, 58,653 acres; in wheat, 7,464 acres; in oats, 7,566 acres; in rye, 1,966 acres.

Cotton production: 23,058 bales; average cotton product per acre, 0.34 bale, 492 pounds seed-cotton, or 164 pounds cotton lint.

Washington county between the Ogeechee and Oconee rivers has within its area the lands of four of the general divisions or regions, viz: the sandy pine hills on the north, red lands and yellow-loam lands in the center, and long-leaf pine and wire-grass lands on the extreme south.

The entire surface of the county is hilly and rolling, with broad and level areas, especially on the south. The sandy pine lands of the north have deep sandy soils, and the subsoils are underlaid by pipe-clay of variegated colors. They are timbered with pine (both long- and short-leaf) and black-jack oak.

Gneisses and granitic rocks appear in the beds of some of the streams, as at Long's bridge, on Buffalo creek (on the county-line), but on the immediate uplands are the sands and clays. Clay-slate is exposed in the bed of Tiger creek, 2 miles southwest of Long's bridge. This sandy pine-hills region lies north of a line from Warthen's store to Long's bridge, and thence southwest to the mouth of Gum creek.

The yellow-loam lands extend from these pine hills to the Johnson county-line, on the southwest, and 5 miles south of Sun Hill, on Williamson's Swamp creek. The lands north of Tennille are rolling and sandy, with clay subsoils, and have a growth of oak, hickory, and pine. South from Tennille they are more level, and long-leaf pine is more prominent.

Beds of white marl and limestone, with very many clypeasters and other fossils, underlie the entire region, being exposed at a number of points. Analyses of this marl made by the state geological survey show it to contain of carbonate of lime, 89.08 per cent.; phosphoric acid, 0.78 per cent; sand, 5.32 per cent. The sample was taken from a large outcrop near Tennille, in which are many fossil bones.

North of Sandersville at several points are other beds of a soft white marl differing in character from this but having a high percentage of lime, and well adapted for fertilizing purposes. Siliceous rocks containing much opal (both common and fine varieties) occur seven miles north of Sandersville in the red clay lands and in other localities in the county.

Red lands of the Red Hills belt cover large areas in this yellow-loam region, and perhaps are most prominent along Buffalo and Keg creeks and the Oconee river on the west. The surface of the country is there rolling, with high hills rising abruptly from the edge of the swamps 150 or 200 feet and heavily timbered on the slopes. The red clays capping the hills are 10 or 15 feet deep, and frequently contain silicified shells. Away from the bluffs the lands are more level and sandy. These clay lands predominate around Sandersville and for 3 miles southwest, and have a growth of post and white oaks and hickory.

The wire-grass section comprises but a small and open area on the southeast, the growth being almost exclusively long-leaf pine and wire-grass, with some black-jack. The soil and subsoil are sandy, and not very productive.

Of the area of the county, 3½ per cent. is said to be irreclaimable swamp. A little more than 35 per cent. of the county area is under tillage, chiefly in cotton and corn. The former is the chief crop, and has an average of 98.4 acres per square mile, embracing 43.8 per cent. of the tilled lands. Burke is the only county in the state having a greater total number of bales, but in its average acres per square mile Washington is surpasssed by twenty-one counties, and in bales per square mile by ten counties.

ABSTRACT FROM THE REPORT OF H. N. HOLLIFIELD, OF SANDERSVILLE.

The lands of the northern and western parts of the county are stiff red clays, while on the south and east they are thin and sandy. The uplands are preferred for cotton, as it matures earlier and is not injured by the early frosts.

The *stiff red clay lands*, comprising 30 per cent. of the area of the county, are the best for cotton. They are found all over the western, middle, and upper parts of the county, and have a growth of long-leaf pine, oak, and hickory, a depth of 18 inches, and are underlaid by a deeper red clay. These lands are impervious to water unless well plowed, are too hard to plow in dry seasons, though early, warm, and well drained, and are best adapted to cotton. Cotton comprises 60 per cent. of the crops, and grows from 2 to 6 feet high, but is most productive at 3 or 4, and runs to weed when the ground is very rich and highly stimulated unless restrained by topping. Fresh lands yield 700 pounds of seed-cotton per acre the first year and 500 to 600 pounds the second; 1,485 pounds make 475 pounds of lint the second year, which rates as middling. May-pop vines, Bermuda grass, and hog-weeds are most troublesome. None of the land lies turned out, and with a little care it is always productive. The lands wash readily on slopes, but no very serious damage is done.

The *brown light clays* or chocolate loams comprise 25 per cent. of the county area, and have a growth in which long-leaf pine predominates. The soil is 6 inches deep, and the subsoil is an impervious clay, heavy and putty-like. The soil is easily tilled in all seasons, is early, warm, well drained, and is best adapted to corn and wheat. Cotton comprises two-thirds of the crop, the plant growing from 18 to 36 inches high, and yielding from 400 to 500 pounds of seed-cotton per acre on fresh land and at three years' cultivation. After three years the yield decreases. Hog-weeds and nettles are most troublesome. One-third of the land now lies out, but after ten or twelve years' rest it yields very well. The lands wash readily, and are sometimes seriously damaged. The valleys also suffer injury. The various methods of horizontalizing, hillside ditching, and underdraining are tried with success in checking the damage.

The *light sandy and gravelly land* of the lowlands comprises about 20 per cent. of the area of the county. It has a growth of pine, black-jack, gum, and sassafras. Its color varies from brown to black, and its depth is from 4 to 12 inches. Its subsoil is either a yellow clay or a fine sand, containing hard gravel and pebbles. The soil is late, cold, and ill drained, easy to till, and best adapted to grain, although cotton comprises one-third of the crops. Cotton grows to a height of from 6 to 18 inches, yielding from 300 to 400 pounds of seed-cotton, but after five years almost nothing, or 200 pounds at most. One-half of this land now lies out, and with manure will produce tolerably well. It washes readily, but no damage is done.

Cotton is shipped, as soon as ginned, to Savannah by railroad at 50 cents per 100 pounds.

JOHNSON.

(See "Pine barrens and wire-grass region".)

LAURENS.

Population: 10,053.—White, 5,702; colored, 4,351.

Area: 740 square miles.—Woodland, all; oak, hickory, and pine uplands, 259 square miles; lime-sink (wire-grass) region, 74 square miles; pine barrens (wire-grass), 407 square miles.

Tilled lands: 89,834 acres.—Area planted in cotton, 20,689 acres; in corn, 25,563 acres; in wheat, 478 acres; in oats, 4,745 acres; in rye, 498 acres.

Cotton production: 6,863 bales; average cotton product per acre, 0.33 bale, 474 pounds seed-cotton, or 158 pounds cotton lint.

The county of Laurens is divided by the Oconee river, to which nearly all the streams in the county are tributary. The surface of the country is undulating, the northern portion being covered with the lands and growth of the oak, hickory, and pine region, and the southern by wire-grass and long-leaf pine, occupying the largest part of the county.

The oak, hickory, and pine region has its lower limit one mile north of Dublin. The sandy soil and yellow sandy clay subsoil are underlaid in places by a whitish joint-clay having leaf impressions and seams of lignite. The growth of this section is pine, oak, and hickory. Red clay lands are found in some parts of the region. Some siliceous shell-rock is found on Turkey creek, on the northwest, and white limestone underlies the entire region.

The wire-grass and open long-leaf pine region comprises in this county both of its subdivisions. A narrow belt of the lime-sink (represented here by its accompanying siliceous shell-rock) occupies a narrow belt on its northern border, in which Dublin is situated. On the river at this place masses of buhr-stone are underlaid by a stiff brownish variegated clay.

The surface of the country is slightly rolling. South of this belt the region is underlaid by an argillaceous sandstone, inclosing ferruginous spots. The country is but slightly rolling or undulating and very open. The soil is dark sandy; the subsoil a yellow sand.

Two and a half per cent. of the county surface is said to be too swampy for tillage. But 19 per cent. of the county area is under cultivation, though probably 25 per cent. has been cleared. Corn has the greatest acreage; that of cotton is next, and averages 28 acres per square mile, or 23 per cent. of tilled land. Its average product per acre is above that of the region. Cotton is chiefly raised in the northern and middle portions of the county. Lumbering is a prominent pursuit of the southern part, the river affording a means of transportation in rafts to the coast.

ABSTRACT FROM THE REPORT OF ROBERT WAYNE, OF DUBLIN.

The lands of the county vary greatly. The northwest is rolling, with forests of oak and hickory, and is well watered by large creeks, and the south and southeast is level, with a fine growth of yellow pine. There is also a large extent of swamp lands in the county.

The *light gray soils*, with clay subsoils (yellow loam), are the chief cotton lands, and comprise a large part of the county area. The growth is oak and hickory. The soil is 6 inches deep; the subsoil bakes after hard rains, and requires a harrow to pulverize the soils for thorough cultivation. The lands are easy to till at all times, and are best adapted to cotton, which comprises one-half of the crops. The yield on fresh land is from 450 to 800 pounds of seed-cotton per acre; after twenty years' cultivation it is from 200 to 300 pounds. From 1,425 to 1,545 pounds of the former make 475 pounds of lint. The seeds of the first picking are heavier, and a greater weight is required for a bale than later in the season. The later the cotton the better is the yield of lint. The staple rates as middling. From 1,545 to 1,665 pounds are required for 475 pounds of lint when the lands are old, and the staple is shorter. Cotton grows 4 feet high, and is troubled most with crab-grass and crowfoot grass. About one-tenth of these lands lies turned out, and yield very well when again taken in. They wash only in places, and but little damage is done.

ABSTRACT FROM THE REPORT OF J. T. CHAPPELL, M. D., OF LAURENS HILL.

The lands are of three classes: (1) red clays on the hillsides bordering creeks and rivers; (2) gray sandy lands bordering small branches and creeks; (3) high uplands.

The *red clays* comprise one-eighth of the lands, and have a growth of oak and hickory. It is a noteworthy fact that on the southwest sides of the streams the land is red and hilly, and on the opposite less broken and sandy for from one-half to one mile. The surface soil is a brownish, sandy, gritty loam, 6 inches in depth, with a heavier subsoil of a lighter red color, underlaid at 1 foot or 2 feet by a fine red clay. The crops of the county are cotton, corn, and oats. These red lands are early, warm, well drained, and easily tilled in all seasons, and are best adapted to cotton and oats. Cotton comprises one-half of the crops, and yields 1,000 pounds in the seed on fresh land and from 500 to 750 pounds after eight years' cultivation. The staple from old land is shorter and more brittle than from fresh, but this is obviated by manuring the lands. Cotton grows to a height of from 4 to 6 feet, produces and matures best at 3 feet, and runs to weed when crowded and in wet seasons, the remedy being to give good distances and use ammoniated phosphates. Cockleburs and hog-weeds are most troublesome. One-fourth of the land lies turned out; but if allowed to rest twenty years its product for two years after being taken in again is about 75 per cent. of that of the virgin soil. Very little of it washes, and no damage is done.

The *gray land*, with its light-yellow clay subsoil and growth of pine, some oak, and dogwood, comprises about one-fourth of the lands. The soil is coarse, sandy, and gravelly in character, 4 inches deep, underlaid by clay at 2 feet, and is best adapted to corn and oats. Cotton yields on fresh lands from 400 to 500 pounds per acre in the seed, or from 300 to 400 pounds after eight years' cultivation. It grows to a height of from 2 to 3 feet. The land washes readily and covers the bottoms with sand at the end of each gully. No efforts are made to check the damage.

The *gravelly lands* of the pine woods cover five-eighths of the county, and extend from 10 to 15 miles southward. The soil is 3 inches deep, and contains black gravel; the subsoil is somewhat heavier, clay underlying it at 1 foot. Cotton comprises one-half the crops, grows 3 feet high, and yields 500 pounds per acre on fresh land and 300 pounds after eight years' cultivation. The lands are too level to wash much. The river and creek swamps have not been put into cultivation, as cotton is there more subject to rust. Fresh lands produce more weed but less fruit (in proportion to the weed) than old land.

Cotton is hauled in wagons either to the Macon and Brunswick railroad, at Eastman and Cochran, or to the Central railroad, at Toombsboro' and Tennille, for shipment.

WILKINSON.

Population: 12,061.—White, 6,550; colored, 5,511.

Area: 440 square miles.—Woodland, all; sand hills, 101 square miles; oak, hickory, and pine uplands, 339 square miles.

Tilled lands: 101,049 acres.—Area planted in cotton, 25,423 acres; in corn, 32,394 acres; in wheat, 4,872 acres; in oats, 4,937 acres; in rye, 1,404 acres.

Cotton production: 7,966 bales; average cotton product per acre, 0.31 bale, 447 pounds seed-cotton, or 149 pounds cotton lint.

Wilkinson county is separated from Washington on the east by the Oconee river, into which all the streams of the county flow. A belt of red hills passes centrally through it, presenting a rough and broken section. The ridges between the creeks are very narrow and high, and are capped with red clays and sands. The usual features of the red hills are found here, viz: red clays 25 to 50 feet thick, and siliceous fossiliferous rocks with underlying white limestone.

The southern and eastern slopes of the hills are usually abrupt and high, with red loam and a growth of oak, hickory, etc., while the northern and western slopes are more gentle, and have a sandy pine land. The northern limit of this belt is 5 miles north of Toombsboro', thence southwest to 3 or 4 miles north of Jeffersonville, in Twiggs county. The belt is narrow, and southward to Cedar creek the country becomes more sandy and level and the red lands appear less frequently. Pine forms a more prominent growth. On the south of the creek the country is again hilly and broken, with some red loam on the hills, associated with siliceous fossils and shell-rock. Outcropping in the hills are marls and clays, the former with beds of greensand, and the whole underlaid by white limestone. Along the bank of the creek the rock is also found. The growth of the hills is oak, hickory, beach, dogwood, elm, black and sweet gum, maple, etc. On the southwest, near Cool Spring, is a small "flatwoods" area of yellow clayey soil.

In the red hills section or belt small bodies of black prairie land occur occasionally, but are hardly worthy of further mention. The county north of the red belt is level and sandy, with a pine and scrub-oak growth, and belongs to the pine-hills belt of the central region, with its underlying white pipe-clays.

The lowlands and flats along the river are extensive, and in the area include Black lake, on the northeast. The width of the swamp lands is 3 miles or more in many places.

Tilled lands embrace 35.9 per cent. of the county area, while 2.5 per cent. is of irreclaimable swamp. Corn has the largest acreage, that of cotton being next, with an average of 57.8 acres per square mile, or 25.2 per cent. of tilled lands.

ABSTRACT FROM THE REPORT OF T. N. BEALL, OF IRWINTON.

The lands of the county are *light sandy and red clayey*, slightly mixed with sand, and extend across the county from east to west. The soil has a depth of from 12 to 18 inches, with a subsoil of red clay under red soils and yellow sand under gray lands. The red clays are impervious to water. The lands are early, warm, and well drained, and easy to till in all seasons. The chief crops are cotton, corn, wheat, oats, rye, potatoes, and field-pease. Cotton comprises one-third the crops, grows from 2 to 3½ feet high, and runs to weed with too much rain, to prevent which topping and fertilizers are resorted to. The yield on fresh lands is 600 pounds of seed-cotton per acre, the lint rating as middling staple. Land ten years in cultivation yields from 300 to 400 pounds per acre, and 1,545 pounds are then required for a bale of lint, the staple of which is shorter. Crab-grass alone is troublesome. One-fourth of the lands once under cultivation now lies out, but produce very well for a few years when again taken in. The lands wash readily, doing serious damage to the uplands and slightly injuring the valleys. Hillside ditching alone is depended on to check the damage, and with but little success; consequently very little effort is made in that direction.

In October and November cotton is sold and shipped, by railroad, to Savannah at $2 per bale.

BALDWIN.

(See "Metamorphic or middle Georgia region".)

BIBB.

(See "Metamorphic or middle Georgia region".)

TWIGGS.

Population: 8,918.—White, 2,844; colored, 6,074.

Area: 330 square miles.—Woodland, nearly all; sand hills, 103 square miles; oak, hickory, and pine uplands, 227 square miles.

Tilled lands: 67,050 acres.—Area planted in cotton, 29,671 acres; in corn, 23,732 acres; in wheat, 374 acres; in oats, 1,176 acres; in rye, 502 acres.

Cotton production: 8,217 bales; average cotton product per acre, 0.28 bale, 396 pounds seed-cotton, or 132 pounds cotton lint.

The county of Twiggs embraces a somewhat rolling country, bordered on the west by the Ocmulgee river, which receives a portion of the drainage waters, those on the east flowing into the Oconee.

The sand and pine hills region on the north extends from the county-line to within 3 miles of Jeffersonville, its extensive sandy lands being diversified with red clay lands, which occupy some of the ridges. The road leading from Jeffersonville to Macon lies along one of these, and the underlying red and yellow clays often come to the surface.

At Brown's mount, on the northwest, a siliceous flinty shell-rock occurs, forming a stratum 20 feet thick, overlying a white coral limestone, which is quarried in the neighborhood.

The siliceous shell-rock occurs at a number of points in this section of the county, and is accompanied by red clay hills. On the east of the "ridge road" the lands are usually very sandy, and are covered with a growth of long-leaf pine, scrub oak, and black-jack.

The red hills occupy a belt extending across the central portion of the county. This belt is widest on the southwest, narrowing northeastward into Wilkinson county. The red clays cap the hills and ridges of this rough and broken area and have a depth of 15 or 20 feet, with usually a thin sandy soil on the surface. The ridges are frequently very narrow, and siliceous shell-rock is associated with these clays. Underneath are white joint-clays with leaf impressions, and finally the soft white limestone (Claiborne) with fossil clypeasters. On the slopes of these hills there occasionally occur small prairies of a black clayey soil, but so shallow and so closely underlaid by white joint-clays as to be unproductive.

The country becomes less broken on the southeast, the soils more sandy, the subsoils a yellowish clay; the growth is pine, oak, and hickory, the former apparently predominating. A small area of "flatwoods" with a yellow clay soil occupies the ridge from 2 miles north of Twiggsville southward into Pulaski county. The growth is post oak, red oak, black-jack, and hickory, and the lands are productive.

On the southwest, between Tarversville and the river, the country is very hilly and broken, the hills being high and covered with red clays and a growth of oak, hickory, walnut, elm, etc. The white limestone mentioned above is found here in abundant outcrops. Ferruginous sandstone also occurs in large fragments near the river.

There is in the county about 5 per cent. of irreclaimable swamp lands, and it is said that but about 20 per cent. of the original forest growth still remains. Tilled lands comprise 31.7 per cent. of the county area, the largest part being in cotton, whose average is 89.9 acres per square mile.

ABSTRACT FROM THE REPORT OF F. D. WIMBERLY, JR., OF TWIGGSVILLE.

The uplands of the county are preferred for cotton because of the liability on the lowlands to damage by both frost and rust. These lands may be classed as the red upland, the sandy gray land lying in both the oak and the pine woods, and the black prairie lying on slopes in patches.

The *red land* comprises about one-tenth the area of the county, and extends 3 miles, varying in width from 100 yards to 2 miles. The growth is principally oak and hickory. The soil has a depth of only 2½ inches. The subsoil is a stiff red clay, very hard to break, and very sticky; no plow yet made will turn it, unless under most favorable circumstances. It is impervious to rain, drying off not so readily as gray lands; is gummy in wet seasons, and rather hard to till in dry, but early and well drained. The crops of the county are cotton, corn, oats, sweet potatoes, and ground-pease (to fatten hogs on). The soil is best adapted to cotton and potatoes. Cotton yields on fresh lands 800 pounds of seed-cotton per acre. On lands fifty years under cultivation the yield is 300 pounds, and 1,665 pounds are required for 475 pounds of lint, the staple being longer and better from fresh land. Cotton grows 2 feet high, and runs to weed when seasons are favorable unless restrained by phosphate manures, and topping is early resorted to. Coffee-weed is most troublesome, but hog-weed and "poor Joe" flourish. About one-half the lands now lies turned out, but the amount is being continuously reduced by taking in. They then yield well for a few years. The uplands are badly injured by washing, and also by the efforts made years ago to check the damage by hillside ditching. The valleys are injured only where pipe-clay is washed over them. Some farmers are now beginning to grade the hillsides for protection.

The *gray lands* are generally of a coarse, sandy character, some underlaid by a red-clay subsoil at a depth of 5 or 6 inches. These are the best. The others, underlaid by a mulatto clay at a depth of 12 inches, are very poor, but with guano pay as well as any.

The *black prairie lands* are shallow, and are underlaid by pipe-clay and more or less shell-rock. At places beds of coral crop out, which are very rich in lime, but contain but little phosphoric acid. These lands rust cotton badly, and have been almost wholly abandoned for cotton.

As fast as cotton is baled it is shipped, by wagon or railroad, to Macon at 20 cents per 100 pounds.

PULASKI.

Population: 14,058.—White, 5,824; colored, 8,234.

Area: 470 square miles.—Woodland, all; oak, hickory, and pine uplands, 313 square miles; lime-sink (wire-grass) region, 157 square miles.

Tilled lands: 83,762 acres.—Area planted in cotton, 32,074 acres; in corn, 28,505 acres; in wheat, 208 acres; in oats, 3,370 acres; in rye, 120 acres.

Cotton production: 9,805 bales; average cotton product per acre, 0.31 bale, 435 pounds seed-cotton, or 145 pounds cotton lint.

Pulaski county lies on each side of the Ocmulgee river, and is partly in the oak, hickory, and pine region, with red lands on the north, and partly in the lime-sink division of the wire-grass region.

The surface of the country, varying with each of these regions, is hilly on the northwest, rolling in the central, east, and west belt, and merely undulating or level from Hawkinsville southward.

The red hills cover but a small area, and are about 100 feet above the streams. They are covered with sands and clays, and have a growth of red oak, hickory, and pine. Buhr-stone and white limestone underlie these clays, as shown in outcrops in the gullies and sides of the hills.

The oak, hickory, and pine region covers the greater part of the county, and has a rolling surface, sandy soils, clay subsoils, and a long leaf-pine, post oak, and hickory growth. Lime-sinks occur frequently, and marls and white limestone outcrop in many places. At Hawkinsville one of these exposures occurs and is overlaid by siliceous shell and flint rocks, fragments of which are also found scattered along the banks of the river and over the surface of the country. The limestone is very similar in composition to that of Houston county, and would produce excellent results on the lands.

The wire-grass region begins 2 miles south of Hawkinsville, its limit extending east and west from here and southward over the rest of the county. The country is very open, and the growth almost exclusively long-leaf pine and wire-grass; the soil a fine sandy loam, with a yellow clayey subsoil, underlying clays, and some limestone.

The lands of the county are all considered as tillable with the exception of 4 per cent. of irreclaimable swamp. Lands under cultivation comprise 27.8 per cent. of the county area, though 45 per cent. is thought to have been cleared of its timber growth. Cotton is the chief crop (38.3 per cent. of tilled land), and has an average of 68.2 acres per square mile.

Lumber-mills are very numerous, and it is estimated that two-thirds of the timber consists of pine of superior quality. Ocmulgee river, which flows through the county, affords a convenient means of transportation for rafts of lumber to the coast. The railroad from Hawkinsville connecting with the Macon and Brunswick railroad also furnishes easy transportation of all products to the various markets.

HOUSTON.

Population: 22,414.—White, 6,024; colored, 16,390.

Area: 560 square miles.—Woodland, all; sand hills, 94 square miles; oak, hickory, and pine uplands, 466 square miles.

Tilled lands: 169,827 acres.—Area planted in cotton, 72,611 acres; in corn, 48,785 acres; in wheat, 3,289 acres; in oats, 10,570 acres; in rye, 223 acres.

Cotton production: 19,099 bales; average cotton product per acre, 0.26 bale, 375 pounds seed-cotton, or 125 pounds cotton lint.

Houston county is bounded east by the Ocmulgee river, into which all the streams of the county flow, with the exception of Hog Crawl creek, on the extreme southwest, which is separated from the rest by the Atlantic and Gulf water-divide and empties into the Flint river.

The county is within the central cotton region, and the three divisions or belts, viz, sand and pine hills, oak, hickory, and pine lands, and red hills, are all here represented.

From Echaconnee creek (the north boundary) southward to near Sandy Run creek and Bushyville the pine-hills country is quite level and sandy (see analysis, page 42), the wells showing underlying clays for 20 feet over coarse, micaceous sands and pebbles, and finally white clays. Ferruginous sandstones and gravel and sand conglomerates are scattered over the face of the country. The growth is long-leaf pine and scrub-oak undergrowth. South of this is the oak, hickory, and pine region, with its sandy soils and yellow-clay subsoils, which extends to Big Indian creek. The surface of the country is somewhat rolling, the ridges are broad and flat or gently undulating, and the approaches to the streams are abrupt and broken. Variegated pipe-clay underlies very nearly all of these lands, and ferruginous sandstone is abundant on the surface, frequently producing red sandy lands.

On the east of this region are found white coral limestones, with associated clypeasters or "petrified Indian biscuits"; but these chiefly underlie the red hills of the southern part of the county. Siliceous shell-rock fragments are also found near by. Fort Valley, on the west, is located on the high level plateau of the water-divide. The lands in this section are interspersed with spots of red clay loams, but all are underlaid by the white or variegated pipe-clay.

The red hills comprise that part of the county lying south of Big Indian creek and across from east to west. These hills are over 200 feet above the streams, are usually broad and level, and have sandy soils in the interior and red clay loams on the borders and on the slopes. Siliceous shell-rock or buhr-stone underlies or is contained in these red clays, while still below are soft friable white limestones, or, as on the south of Perry, greensand clays and marls, and then the limestone.

The following section of Ross hill, 3 miles south of Perry, is a fair representation of the underlying strata:

Reddish loam, 15 feet.
Stiff white clay, with silicified shells, etc., 30 feet.
Greensand clay, with shell impressions, 2 feet.
White pipe-clay, with beds of clayey limestone, 40 feet.
Semi-crystalline limestone, hard and compact (Montezuma), 10 feet.
White marl or limestone, 12 feet.
Yellow joint-clay, with white spots, 50 feet.

The greensand clay of this bluff is shown by analysis to contain nearly 3 per cent. of potash. (For analysis of white marl, see page 46.) A few spots of black prairie are found on the slopes of these hills. Tilled lands embrace 47.4 per cent., or nearly half of the area of the county, though 64 per cent. is said to have been cleared, and 2 per cent. is of irreclaimable swamp. Cotton is the chief crop, and has an acreage of 129.7 acres per square mile; a number surpassed only by that of Troup and Pike, comprising 42.8 per cent. of the lands under cultivation; its acreage is above 20 per cent. of the county area. In its total acreage it is surpassed only by Burke county, and in bales by Burke and Washington. Its average product per acre is very low, there being 109 counties whose rank is above it.

The general character of soils and methods of culture are the same as in the adjoining counties of Twiggs and Macon.

Shipments of cotton are made from Perry by railroad to Fort Valley, and thence to Savannah.

CRAWFORD.

(See "Metamorphic or middle Georgia region".)

TAYLOR.

Population: 8,597.—White, 4,770; colored, 3,827.

Area: 400 square miles.—Woodland, all; sand hills, 368 square miles; oak, hickory, and pine uplands, 7 square miles; metamorphic, 25 square miles.

Tilled lands: 44,770 acres.—Area planted in cotton, 18,064 acres; in corn, 16,426 acres; in wheat, 3,079 acres; in oats, 2,108 acres; in rye, 246 acres.

Cotton production: 4,854 bales; average cotton product per acre, 0.27 bale, 384 pounds seed-cotton, or 128 pounds cotton lint.

The chief feature in the topography of Taylor county is the high ridge covered with deep white sand that lies east and west just south of the metamorphic region and between Butler and Patsaliga creek, which rises abrupt and high above the metamorphic on its northern side, but gradually falls southward to the county-line, and is covered with a growth of long-leaf pine. It is about 175 feet above the creek. North of the ridge the sands continue a few miles, but under them are found the metamorphic rocks; and before Daviston and Carsonville are reached the surface of the country is covered with the gray sandy and red-clay lands of the latter, with their oak and hickory growth. Clay-slates form a bed of from 50 to 60 feet in this part of the county, resting on biotite gneisses, as seen in the river bluffs. Serpentine is exposed in the beds of streams with an apparent thickness of several hundred feet.

Lying parallel with Flint river, in the upper part of the county, north of Carsonville, are a number of prominent and rounded clay hills, standing isolated 125 feet above the surrounding level country and covered with large rounded quartz-rocks, some a foot in diameter, and lying mostly on the river side. This metamorphic region is hilly and broken, especially on the east around Grab All and Gray's ferry.

The pine-hills region, with its deep sandy lands and growth of pine and scrubby black-jack, covers most of the county. Its surface is undulating southward from the pine ridge mentioned. Variegated clays underlie the land, and ferruginous sandstone is found in scattered fragments on the surface. The small streams have usually a low, flat sandy bottom, which is covered with a growth of bays and gallberry bushes. Along the river the banks are low as far north as the agency, and the bottoms wide and partly irreclaimable.

But 17.5 per cent. of the county area is under tillage, and that chiefly in cotton, whose acreage comprises 40.4 per cent. of the tilled land, and averages 45.2 acres per square mile.

ABSTRACT FROM THE REPORT OF JAMES A. ADAMS, OF REYNOLDS.

The chief cotton lands of the county have a *sandy loam upland soil* 5 inches deep, with clay subsoil, underlaid by a brown gravelly clay, or, in some places, a variegated pipe-clay. They extend 8 miles north and 20 miles south of Reynolds, and have a growth of yellow long-leaf pine, hickory, red oak, round-leaf black-jack, and some dogwood. The crops of the county are cotton, oats, wheat, and potatoes. Cotton comprises one-third of these, and yields 500 pounds of seed-cotton per acre on fresh land, or 250 pounds after ten years' cultivation; 1,485 pounds make 475 pounds of lint, rating as upland middling. Crab-grass, and what is known as poverty-weed, are most troublesome. These lands have so few steep slopes that they wash but little, and limited damage is done.

The *light sandy lands*, having the same growth as that mentioned, and with a yellow sandy clay subsoil, yield only 400 pounds of seed-cotton per acre when fresh and 200 pounds when old and without manure. In other respects there is no difference from the other.

On the *lowlands* cotton is subject to overflows and premature frosts.

Shipments are made by railroad to Columbus or to Macon.

TALBOT.

(See "Metamorphic or middle Georgia region".)

MARION.

Population: 8,598.—White, 4,294; colored, 4,304.

Area: 360 square miles.—Woodland, all; sand hills, 174 square miles; oak, hickory, and pine uplands, 186 square miles.

Tilled lands: 77,951 acres.—Area planted in cotton, 21,579 acres; in corn, 21,053 acres; in wheat, 3,481 acres; in oats, 1,889 acres; in rye, 1,121 acres.

Cotton production: 6,169 bales; average cotton product per acre, 0.29 bale, 408 pounds seed-cotton, or 136 pounds cotton lint.

Through the middle of Marion county there is a dividing ridge separating the tributaries of the Flint and Chattahoochee rivers. That portion of the county north of Buena Vista and Glen Alta is rolling and covered with the white sands and pine growth of the sandy pine-hills region, and is but slightly under cultivation, the lands being poor and unproductive. Blue micaceous and shell clays are found underlying these hills a short distance north of Tazewell, and also on Richland creek, north of Buena Vista. They contain scarcely any lime, and are not a profitable fertilizing element.

Ferruginous concretions inclosing sand exist in abundance on the hills. The hill on which the county-seat is located has a thick covering of ferruginous pebbles.

Between Buena Vista and Kinchafoona creek (on the west) there are deep white-sand beds, which extend southward along the creek; but on the west of the stream there are red clay lands, and these are also found over the southern part of the county.

The entire surface of the country is rolling and somewhat hilly, but has broad areas of level lands; 5 per cent. is too hilly for cultivation. In the banks of the creek at Pineville, in the southwestern corner of the county, there are beds of yellow and blue fossiliferous Cretaceous marl, containing more lime than those mentioned above.

There is 1 per cent. of irreclaimable swamp land in the county.

The lands under tillage embrace 33.8 per cent. of the county area, though 75 per cent. are said to have been cleared of their original timber growth. Of these lands, 27.7 per cent. is in cotton, one of the chief crops (corn having nearly the same acreage), its average being 59.9 acres per square mile.

ABSTRACT FROM THE REPORT OF G. W. C. MUNRO, OF BUENA VISTA.

Some of the uplands are rolling and sandy, but very productive; others are level, with a good clay subsoil, but of poorer quality. Upland cotton can be planted earlier than that on the lowlands, but without fertilizers does not grow off so rapidly as on the latter or produce as much. The proportion of lowlands is very inconsiderable when compared to the uplands; but as a general thing they are level and last well, but have to be rotated and rested in order to retain their fertility.

The soils devoted to cotton culture may be classed as clay lands, or those having a good clay subsoil; sandy lands, or those whose subsoil is loose and several feet deep; and hummock lands.

The *clay lands* are the best, and comprise about one-half of the county, covering areas sometimes 8 or 10 miles long and 2 or 3 wide. The growth is pine, with an undergrowth of black-jack, and some hickory and post oak. The soil is a clay mixed with sand and decayed vegetable matter, pale yellow and brown in places, and in others almost white, 6 inches deep, with a tolerably stiff subsoil, red in color, and containing more or less sand; a hard-pan, quite impervious in places, and should be broken with the plow or crops will suffer if the seasons are unfavorable. The lands are easily tilled in all seasons when well broken up in the spring. The crops of the county are cotton, corn, oats, wheat, rye, potatoes, sugar-cane, ground-pease, chufas, millet, and Hungarian grass, and there is seldom a failure to make a good crop when well fertilized. Cotton yields from 700 to 1,000 pounds per acre in the seed on fresh lands, the lint rating high. Ten years' cultivation reduces the yield to about 300 pounds. The quantity and the quality of the staple are affected principally by the seasons. The plant grows 2½ feet high on an average, but from 3 to 4 feet is best. It seldom runs to weed, and superphosphates favor fruiting. Crab-grass generally and hog-weeds frequently give much trouble, and on badly worn soils poverty-weed grows abundantly. About one-twentieth of the lands now lies turned out, caused by washing and gullying. When not too badly washed they yield pretty well for a few years after resting. The valleys are injured to such an extent that the small streams that flow through and drain them are filled up and have to be ditched. Horizontalizing and hillside ditching yield satisfactory results when rightly done.

The *sandy lands* of the north and east of the county cover about one-half of its area, and have a growth of pine principally and an undergrowth of black-jack. The soil is a fine or coarse sandy loam with a depth of 1 foot and a subsoil of sand, with a little clay in places and coarse sand in others. It is late and cold, easily tilled, and can be plowed in wet as well as in any season, but cannot be planted as early as the clay lands. The soil is best adapted to cotton and corn when fresh, but when old and worn cotton rusts on it badly. Cotton grows 2 feet high, and yields on fresh lands from 600 to 1,000 pounds per acre in the seed. Ten years' cultivation reduces this to 300 pounds. When the lands are fresh, rag-weeds, but when old, poverty-weeds, are the most troublesome. The lands wash readily, and serious damage is done. One-twelfth of the land now lies out.

The *hummocks* comprise only a few hundred yards in the county, and have a growth of white oak, beech, maple, walnut, hickory, ash, etc. The soil is a fine sandy loam, blackish in places, 10 inches or more in depth, with a yellow clay or coarse sandy clayish subsoil, quite leachy generally. Fine crops of sugar-cane, corn, and cotton are produced on these lands, cotton growing 4 feet high and yielding about 1,000 pounds per acre on fresh land, or 400 pounds on land ten years in cultivation if rolling and never ditched. Hog-weeds alone are troublesome.

From the 15th of September to the 25th of December cotton is shipped by wagon to Americus, Sumter county, at 50 cents per 100 pounds.

MUSCOGEE.

(See "Metamorphic or middle Georgia region".)

CHATTAHOOCHEE.

Population: 5,670.—White, 2,130; colored, 3,540.

Area: 220 square miles.—Woodland, all; sand hills, 76 square miles; oak, hickory, and pine uplands, 144 square miles.

Tilled lands: 38,457 acres.—Area planted in cotton, 15,442 acres; in corn, 11,618 acres; in wheat, 740 acres; in oats, 1,774 acres; in rye, 396 acres.

Cotton production: 4,460 bales; average cotton product per acre, 0.29 bale, 411 pounds seed-cotton, or 137 pounds cotton lint.

Chattahoochee is a rather hilly county, and is separated from Alabama by the Chattahoochee river and from Muscogee county by Upatoi creek. The greater part of the northern portion of this county is covered with white micaceous sands and ferruginous sandstones of the sand-hills region, underlaid by variegated clays. In some places on the northwest heavy beds of white water-worn pebbles and ferruginous sand and pebble conglomerates are exposed in bluffs or hillsides. In the southern part of the county the red clays approach nearer the surface, and often, by the washing away of the sands, are exposed on the hillsides and tops and are more or less intermixed with the sands. These hills are embraced in the yellow-loam region south of Glen Alta and Cusseta. They are often 100 or 150 feet above the streams, and their lands wash readily, forming great gullies.

The lands along the river on the northwest are generally quite level, but become hilly and broken northward. They are 25 feet above low water, and in their bluffs there is exposed under the sands and clays 18 feet of blue micaceous and gypseous clay, with a small percentage of lime, and containing a few Cretaceous fossils. A white sand underlies the bed. These marls outcrop along Upatoi creek for some distance, and southward along the river become more fossiliferous and valuable. An analysis of a specimen taken from near Cusseta shows only about 10 per cent. of carbonate of lime and a small amount of potash and phosphoric acid. For fertilizing uses the marl is almost worthless.

The growth of the county is largely pine on the hills, with oak, hickory, etc., on the lower and better lands. The gray oak and hickory lands are considered the best, and will yield from 10 to 15 bushels of corn, 8 to 10 bushels of wheat, or about 600 pounds of seed-cotton per acre. Their growth is red and post oaks, hickory, and poplar.

The mulatto and red lands have also a red and post-oak growth, and will yield from 8 to 10 bushels of corn or of wheat or 600 pounds of seed-cotton per acre. Lands under tillage embrace 27.3 per cent. of the county area, though it is thought that 60 per cent. has been cleared. Of these 40.2 per cent. is in cotton, the chief crop, its average being 70.2 acres per square mile.

ABSTRACT FROM THE REPORT OF J. H. WOOLDRIDGE, OF JAMESTOWN.

The uplands of the county on the river are partly black prairie and partly hog-wallow. The soils devoted to cotton are the black uplands, lying mostly on hills and branches, alluvial bottoms adjacent to branches and small streams that overflow occasionally, and light sandy bottoms on various branches of creeks and rivers.

The chief land is that of the *alluvial bottoms*, comprising one-fourth or one-fifth of the lands of the region, which are from 4 to 6 miles in extent. Its growth is pine, oak, hickory, sweet gum, chestnut, elm, dogwood, chinkapin, willow, and persimmon. The soil is a fine sandy clay loam, from yellow to red in color, with a red clay or yellow sandy subsoil. The crops of the county are corn, pease, oats, wheat, rye, potatoes, pinders (ground-pease), chufas, and cotton. All do well under favorable seasons and good culture. Cotton comprises one-half of the crops, and yields from 400 to 800 pounds of seed-cotton per acre, 1,545 pounds of which make 475 pounds of lint, rating as middling. The plant grows from 1 foot to 10 feet high, running to weed by late planting and with too much rain. Morning-glory vines, cocklebur, crab-grass, and crowfoot are the most troublesome weeds. One-half the lands originally cultivated now lies turned out, and produces moderately well for a few years when again cultivated. Considerable damage is done to slopes and valleys by the ready washing of the land. Hillside ditching and horizontalizing are successful in checking the injury.

Cotton is shipped to Columbus by river boats at 50 cents per bale.

STEWART.

Population: 13,998.—White, 4,376; colored, 9,622.

Area: 440 square miles.—Woodland, all; oak, hickory, and pine uplands, 440 square miles.

Tilled lands: 107,251 acres.—Area planted in cotton, 44,449 acres; in corn, 31,979 acres; in wheat, 2,652 acres; in oats, 5,284 acres; in rye, 206 acres.

Cotton production: 12,653 bales; average cotton product per acre, 0.28 bale, 405 pounds seed-cotton, or 135 pounds cotton lint.

Stewart county, separated from Alabama by the Chattahoochee river, is included in the oak, hickory, and long-leaf pine region. Its general surface in the interior is hilly and broken, but there are broad, level valley lands along the river a mile or two wide and level uplands on the east around Richland, and also south of Lumpkin, the county-seat. The banks of the Chattahoochee river are high, and along their bluffs are exposed blue-shell marls, and also greensand marls rich in potash. The lime percentage is not great.

These Cretaceous marls are also exposed in the beds of Hitchetee, Hannahatchie, and other creeks of the county, except on the southeast, where the country is higher and of a different character.

The southeastern limit of the blue-marl region is found 5 miles north and 8 miles west of Lumpkin. At the former locality the blue marl is overlaid by yellow fossiliferous clays, the hills being capped with red clays and white sands. These hills wash readily, and immense gullies and ravines have been formed on the sides, showing heavy beds of clays variegated in color, and known as "calico clay". The same is true of the hills for 8 miles on the west of Lumpkin. They are covered in many instances with a hematite iron ore having a bright surface. Siliceous shell-rock, or buhr-stone (Tertiary), and ferruginous sandstone is also abundant in places. These hills are about 450 feet above the river, and, while very sandy, are often red, from the exposure of the red clays underlying the white sands or from the intermixture of the two. These red clays occur over the eastern side of the county and northward into Chattahoochee.

From Lumpkin southward the lands, while high, are more level and the sands not so deep. Red soils also cover large areas (see analysis, page 40), and fragments of buhr-stone are found on the surface. In these latter siliceous sponge spicules have been observed, and the rocks seem to be similar to those found in Burke county, on the east of the state.

The lands of the western part of the county are generally quite level, except along the small streams. From Florence and southward the valley extends eastward several miles, the soil being a sandy loam and the subsoil a clay. The lands are very productive and have been long in cultivation.

Of the county area 2½ per cent. is too hilly or broken for cultivation and 1 per cent. is irreclaimable swamp. Of the total area 38.1 per cent. is under tillage, chiefly in cotton and corn, the former having the largest acreage, and averaging 101 acres per square mile. The county ranks in this average as sixteenth in the state and in total acreage as eighth, in total number of bales as thirteenth, and in bales per square mile as twentieth.

ABSTRACT FROM THE REPORT OF W. H. TATUM, OF HANNAHATCHIE.

The lands of the county have an oak and pine growth, and are best adapted to cotton and cane. The crops are corn, cotton, pease, and sugar-cane. Cotton comprises two-thirds of the crops, grows from 2 to 6 feet high, runs to weed in wet summers and with excess of rain, and yields from 800 to 1,000 pounds of seed-cotton per acre, the lint rating as middling. After six years' cultivation the yield is from 500 to 800 pounds, and 1,665 pounds make 475 pounds of lint, the staple of which is not so good by 10 per cent. Hog-weeds are very troublesome. One-fourth of the lands originally cultivated now lies turned out, and when again taken in produce finely for three or four years. When not ditched the lands by washing are greatly damaged, and the valleys are also injured.

As fast as ginned cotton is shipped to Columbus at 40 cents per 100 pounds.

WEBSTER.

Population: 5,237.—White, 2,667; colored, 2,570.

Area: 230 square miles.—Woodland, all; oak, hickory, and pine uplands, all.

Tilled lands: 43,762 acres.—Area planted in cotton, 17,235 acres; in corn, 16,121 acres; in wheat, 2,236 acres; in oats, 2,809 acres; in rye, 463 acres.

Cotton production: 4,642 bales; average cotton product per acre, 0.27 bale, 384 pounds seed-cotton, or 128 pounds cotton lint.